

SERVICE MANUAL

BE-3D CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-28WX1A	RM-839	Italian	SCC-K05J-A	KV-28WX1E	RM-839	Spanish	SCC-K06J-A
KV-28WX1B	RM-839	French	SCC-K01J-A	KV-28WX1K	RM-839	OIRT	SCC-K08S-A
KV-28WX1D	RM-839	AEP	SCC-K07K-A	KV-28WX1U	RM-839	UK	SCC-K04G-A



TRINITRON® COLOR TV
SONY®

ITEM	MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H	VHF: E2-E12 UHF: E21-E69 CABLE TV(1) : S1-S41 CABLE TV(2) : S01-S05,M1-M10, U1-U10 ITALIA A-H, H1, H2	PAL NTSC3.58/4.43 (video input only)	
French	B/G/H, D/K, L, I	B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R20 UHF: B21-B69 L VHF: F2-F10 UHF: F21-F69 CABLE TV B-Q, S21-S44 I UHF: B21-B69	PAL, SECAM NTSC3.58/4.43 (video input only)	
AEP	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R20 UHF: B21-B69 CABLE TV S1-S41, S01-S05	PAL, SECAM NTSC3.58/4.43 (video input only)	
Spanish	B/G/H, D/K	PAL B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R20 UHF: B21-B69 CABLE TV S1-S41, S01-S05	PAL, SECAM NTSC3.58/4.43 (video input only)	
OIRT	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV S1-S41, S01-S05	PAL, SECAM NTSC3.58/4.43 (video input only)	
UK	I	UHF: U21-U69	PAL NTSC3.58/4.43 (video input only)	

MODEL	28WX1A	28WX1B	28WX1D	28WX1E	28WX1K	28WX1U
Power Consumption	74W	146W	146W	146 W	95W	146W

SPECIFICATIONS

Picture Tube Super Trinitron
Approx. 71 cm (28 inches)
(Approx. 67 cm picture measured diagonally)
110° -deflection

[FRONT]

- 3, Video input - phono jack
- 3, Audio inputs - phono jacks
- 3, S video input - 4 pin DIN
- ⌚ Stereo minijack - headphone jack

Rear/Front Terminals

[REAR]

- 1 21-pin Euro connector (CENELEC standard)
- Inputs for audio / video signals
- Inputs for RGB
- Outputs for TV audio and video signals
- 2/→ 2, 21-pin Euro connector (CENELEC standard)
- Inputs for audio / video signals
- Inputs for S video
- Outputs for TV audio and video signals (selectable)
- Audio output - phono jack (variable)

Sound output

Left/Right

2x10W (RMS)
2x20W (music power)

Dimensions

736x528x500 mm approx.

Weight

Approx. 39.0 kg

Supplied accessories

RM-839 Remote Commander (1)
Batteries R6 (2)

Other features

Fastext,
NICAM (KV-28WX1B/28WX1E/28WX1U only)


[RM-839]

Remote control system	Infrared control
Power requirements	3V dc (2 batteries) R6 (size AA)
Dimensions	Approx. 210x45x24 mm (w/h/d)
Weight	Approx. 90g (Not including battery)

Design and specifications are subject to change without notice.

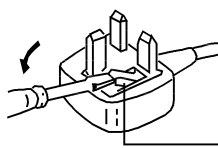
Model name	KV-28WX1A	KV-28WX1B	KV-28WX1D	KV-28WX1E	KV-28WX1K	KV-28WX1U
Item						
PIP	OFF	OFF	OFF	OFF	OFF	OFF
MPIP	OFF	OFF	OFF	OFF	OFF	OFF
Rotation Coil	ON	ON	ON	ON	ON	ON
VM Set	ON	ON	ON	ON	ON	ON
Scart 1	ON	ON	ON	ON	ON	ON
Scart 2	ON	ON	ON	ON	ON	ON
Front in (3)	ON	ON	ON	ON	ON	ON
AKB in 16:9 mode	ON	ON	ON	ON	ON	ON
TXT	ON	ON	ON	ON	ON	ON
FLOF	ON	ON	ON	ON	ON	ON
TOP	ON	ON	ON	ON	ON	ON
Norm B/G/H	ON	ON	ON	ON	ON	OFF
Norm I	OFF	ON	OFF	OFF	OFF	ON
Norm D/K	OFF	ON	ON	ON	ON	OFF
Norm L	OFF	ON	OFF	OFF	OFF	OFF
Language Preset	Italian	French	German	Spanish	OIRT	English

WARNING (KV-28WX1U only)

The flexible mains lead is supplied connected to a B.S. 1363 fused plug having a fuse of 5 AMP capacity. Should the fuse need to be replaced, use a 5 AMP FUSE approved by ASTA to BS 1362, ie one that carries the  mark.

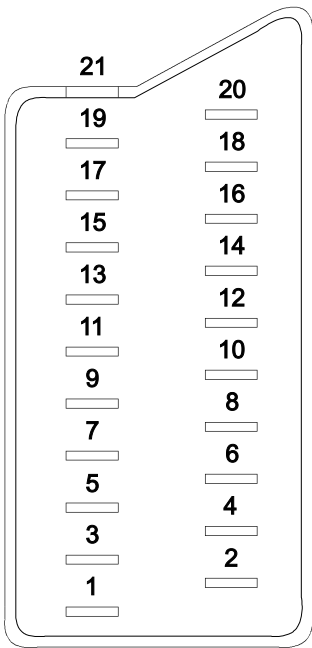
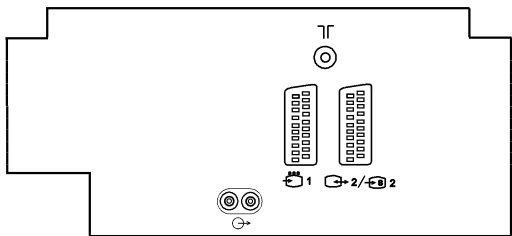
IF THE PLUG SUPPLIED WITH THIS APPLIANCE IS NOT SUITABLE FOR YOUR SOCKET OUTLETS IN YOUR HOME. IT SHOULD BE CUT OFF AND AN APPROPRIATE PLUG FITTED. THE PLUG SEVERED FROM THE MAINS LEAD MUST BE DESTROYED AS A PLUG WITH BARED WIRES IS DANGEROUS IF ENGAGED IN A LIVE SOCKET OUTLET.

When an alternative type of plug is used it should be fitted with a 5 AMP FUSE, otherwise the circuit should be protected by a 5 AMP FUSE at the distribution board.



How to replace the fuse.
Open the fuse compartment with the screwdriver blade and replace the fuse.

21 pin connector (→ 1, ↔ 2 / → 2)



Pin No.	1	2	4	Signal	Signal Level
1				Audio output B (Right)	Standard level : 0.5V rms Output impedance : Less than 1k ohms*
2				Audio input B (Right)	Standard level : 0.5V rms Output impedance : More than 10k ohms*
3				Audio output A (Left)	Standard level : 0.5V rms Output impedance : Less than 1k ohm*
4				Ground (Audio)	
5				Ground (Blue)	
6				Audio input A (Left)	Standard level : 0.5V rms Output impedance : Less than 10k ohm*
7				Blue input	0.7 ± 3dB, 75 ohms, positive
8				Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More than 10k ohms Input capacitance : Less than 2nF
9				Ground (Green)	
10				Open	
11				Green	
12				Open	
13				Ground (Red)	
14				Ground (Blanking)	
15				Red input	0.7 ± 3dB, 75 ohms, positive
16				(S signal) chroma input	0.7 ± 3dB, 75 ohms, positive
17				Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75 ohms
18				Ground (Video output)	
19				Ground (Video input)	
20				Video output	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
21				Video input	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
22				Video input Y (S signal)	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
23				Common ground (plug, shield)	

○ Connected ● Not Connected (Open) * at 20Hz - 20kHz

Pin No.	Signal	Signal Level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB 75 ohm, positive Sync. 0.3V -3 + 10dB
4	C (S signal) input	0.3V ± 3dB 75ohm, positive Sync.

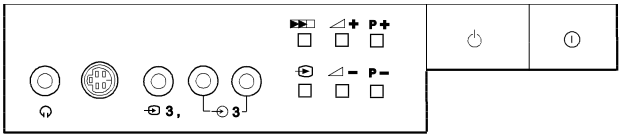


TABLE OF CONTENTS


<i>Section</i>	<i>Title</i>	<i>Page</i>	<i>Section</i>	<i>Title</i>	<i>Page</i>
1. GENERAL			5. DIAGRAMS		
	Overview	7	5-1.	Block Diagrams	33
	Getting Started	8	5-2.	Circuit Boards Location	38
	TV Operation	9	5-3.	Schematic Diagrams and Printed Wiring Boards	38
	Advanced Operations	10		*D Board	43
	Teletext	16		*D3 Board	46
	Optional Equipment	17		*A Board	48
	For Your Information	19		*C Board	58
2. DISASSEMBLY				*D2 Board	60
2-1.	Rear Cover Removal	20		*VM Board	60
2-2.	Chassis Assy Removal	20		*IF Board [VIF (AEP), VIF (UK)]	63
2-3.	Service Position	20		*IF Board [VIF (FR)]	63
2-4.	Wire Dressing	20		IC Blocks	65
2-5.	A Board Removal	21	5-4.	Semiconductors	67
2-6.	Extension Board	21			
2-7.	Picture Tube Removal	21	6. EXPLODED VIEWS		
	Removal and Replacement of The Main-Bracket		6-1.	Chassis	69
	Bottom Plates	22	6-2.	Picture Tube	70
3. SET-UP ADJUSTMENTS			7. ELECTRICAL PARTS LIST		71
3-1.	Beam Landing	23			
3-2.	Convergence	24			
3-3.	White Balance	26			
4. CIRCUIT ADJUSTMENTS					
4-1.	Electrical Adjustments	27			
4-2.	Test Mode 2 :	30			
4-3.	BE-3D Self Diagnostic Software	31			

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.


ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

ATTENTION !!

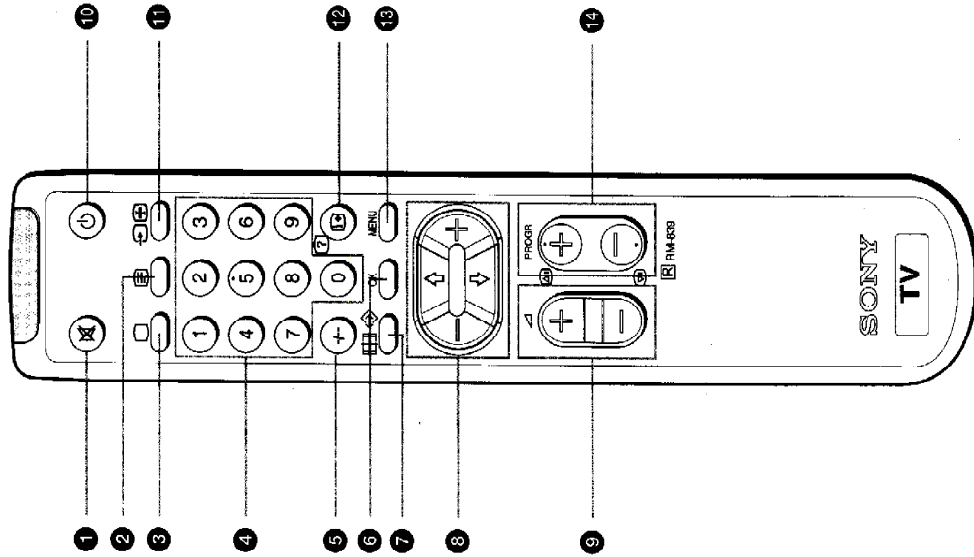
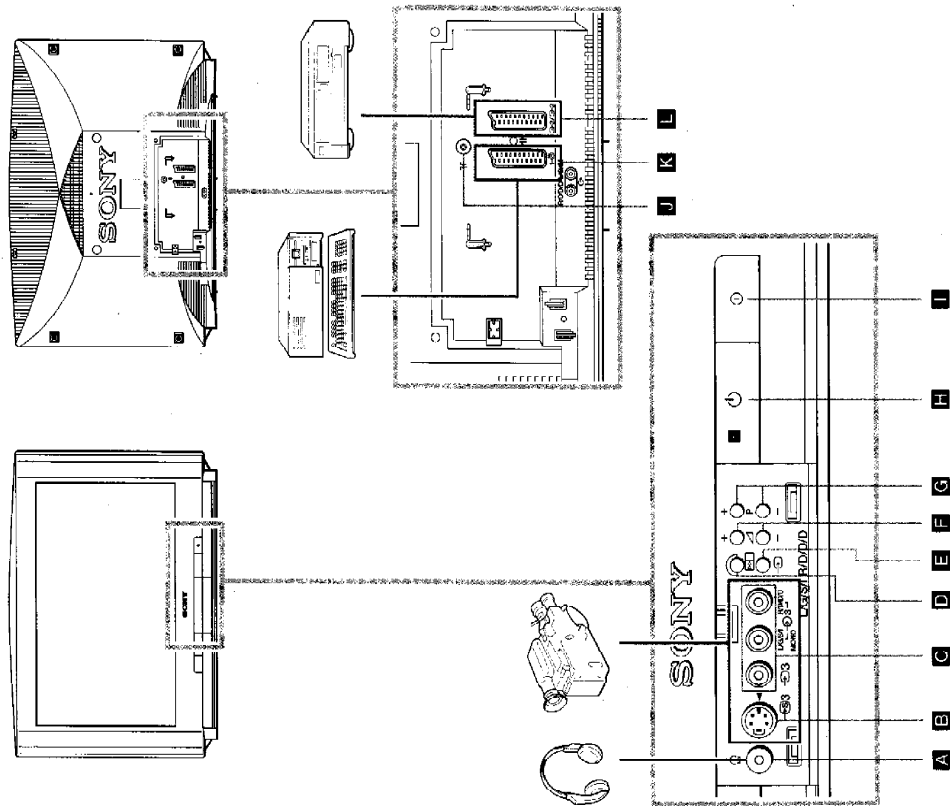
AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MARQUE  SUR LES VUES EXPLOSÉES ET LES LISTES DE PIÈCES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÈCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 GENERAL



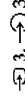










The operating instructions mentioned here are partial abstracts from the Operating Instructions Manual. The page numbers of the Operating Instruction Manual remain as in the manual.



Overview
















This section briefly describes the controls and the buttons on the TV set and on the Remote Commander. Please open the flap at the front of the instruction manual for illustrations of the TV set and the Remote Commander. Letters in boxes refer to the buttons on the TV set, numbers in circles to the buttons on the Remote Commander. For more information, refer to the page numbers given next to each description.

TV buttons and Terminals

Reference and Symbol	Name	Refer to Page
Front of the set		
A 	Headphones jack	29
B  3	S video input jack	29
C  3,  3	Audio / video input jacks	29
D 	Automatic Preset button	11
E 	Input mode button	13
F  +/-	Volume control	12
G  P +/-	Programme button	12
H 	Standby mode indicator	12
I 	Main power switch	12
Rear of the set		
J 	Aerial socket	10
K  1	21 pin Euro connector	29
L  2	21 pin Euro connector	29

Overview


Remote Commander Operation

Reference and Symbol	Name	Refer to Page
1 	Muting on / off button	12
2 	Teletext button	13
3 	TV power on / TV mode button	12, 13
4 1, 2, ..., 9, 0	Number buttons	12
5 - / - -	Double digit entering button	12
6 OK 	OK (Confirmation) button	14
7 	Screen format button	13
	Teletext: Favourite pages button	28
8 	Menu control	14
9  +/-	Volume control button	12
10 	Standby button	12
11  	Input mode button Teletext: Freezing the subpage	12 27
12  	On-screen display button Teletext: reveal button	12 27
13 MENU	Menu on / off button	14
14  	Programme buttons Teletext: Page up / page down buttons	12 13

Step 1

Connecting the Aerial

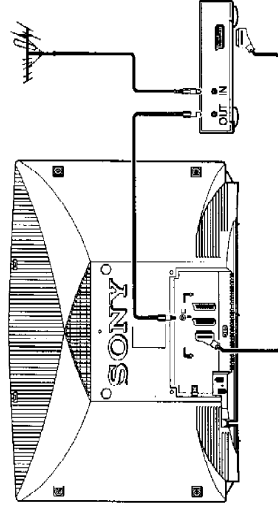
(If you connect a VCR, skip to step 2)

Insert the aerial plug tightly into the aerial socket . Use a good-quality aerial cable (not supplied), corresponding to the relevant regulations.

Step 2

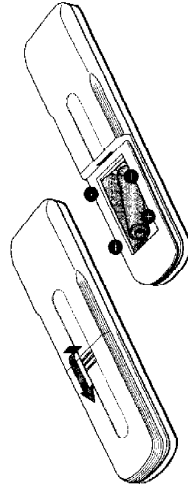
Connecting a VCR

We recommend that you tune in the VCR signal to programme number "0". For details, see "Presetting Channels Manually" on page 16. See "Connecting Optional Equipment" on page 29 for more information.



Step 3

Inserting the Batteries Into the Remote Commander



Respect your environment! Dispose of used batteries in an environmentally friendly way.

Step 4

Presetting Channels Automatically

With this function, the TV can automatically search and store up to 100 different channel numbers.

If you prefer manual presetting, refer to "Presetting Channels Manually" on page 16.

1 Plug into mains.

Press the power switch  on the TV set.

2 Press and hold the button on the TV set until the automatic menu is displayed and the search starts.

After all available channels are stored, the normal TV picture is shown.

Note: Channels are automatically stored as follows:

KV-24WX1U/28WX1U
 Programme 1 BBC1
 Programme 2 BBC2
 Programme 3 ITV
 Programme 4 CH4 or S4C

TV Operation

This section explains functions used whilst watching TV. Most operations are carried out using the remote commander (numbers in circles). All basic functions are also available on the TV set (letters in boxes). Open the flap at the front of the Instruction Manual to see the illustrations of the Remote Commander and the TV set.

TV Operation




To	Press
Switch on	⓪ H on TV
Switch off temporarily	⓪ H TV is now in standby mode and H indicator on TV lights up.
Switch on from standby mode	⓪ 3 , PROGR +/- 4 6 or any number button 4 .
Switch off completely	⓪ 1 on TV To save energy, switch off your TV completely when TV is not in use.
Select programmes	PROGR +/- 4 6 or number buttons 4 For double digit number, press -/- 5 then the number e.g. For 23, press -/- 5 then 2 and 3.
Display on screen indications	⓪ 12 . Press again to make the indications disappear.
Adjust the volume	Δ + or 5 F
Mute the sound	⊗ 1 . Press again to restore the sound.
View video input picture (see page 30 for detailed information)	↶ 15 E repeatedly until the desired video input appears. Press ⓪ 3 to restore the TV picture.

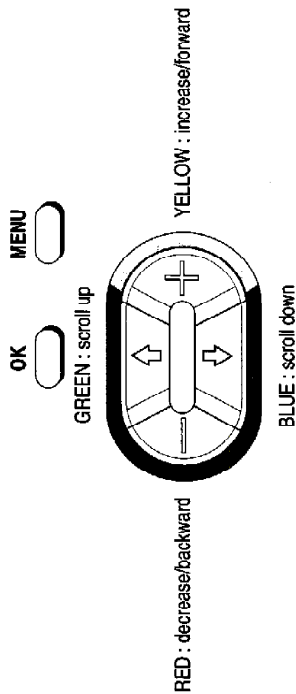
TV Operation (continued)

To	Press
Operate Screen Mode (see page 18 for detailed information)	⓪ 7 . 4:3 → Smart → Zoom → Wide When using Zoom mode select 'Scroll' to see the cut-off part of the screen.
View teletext (see page 27 for detailed information)	
Switch on	⓪ 2
Select a page	three number buttons 4 or ⓪ 12 (for next page) or ⓪ 7 4 (for previous page).
Use fasttext	Blue, Green, Red or Yellow 3 .
Switch off	⓪ 3

Adjusting and Setting the TV Using the Menu








You can adjust and set various functions on the TV using the following remote commander buttons:

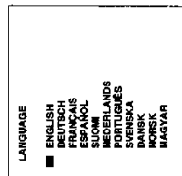
- 1 Press MENU  to switch menu on/off.
- 2 Use the menu control buttons  and OK button  (confirm) as follows:



Choosing the Menu Language







This function enables you to change the language of the menu screens.

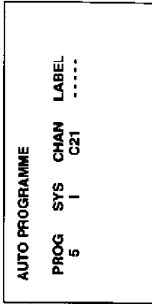
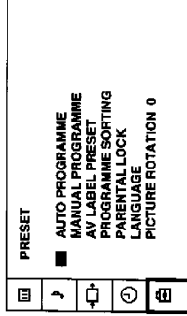
- 1 Press power switch  on the TV. If the standby indicator  on the TV is lit, press  or a number button  on the Remote Commander.
- 2 Press the MENU button  on the remote commander.
- 3 Press blue or green  to select the language you want then press yellow .
- 4 Press the MENU button  to restore the normal TV picture.



Presetting Channels Automatically

You may have already preset the channels automatically by using the method shown on page 11. You can also preset channels automatically by using the remote commander as follows:

- 1 Press the MENU button .
- 2 Press blue or green  to select the symbol  on the menu screen then press yellow .
- 3 Press blue or green  to select 'AUTO PROGRAMME'.
- 4 Press and hold yellow  until the automatic menu is displayed and the search starts.
After all available channels have been preset, the normal TV picture is shown.



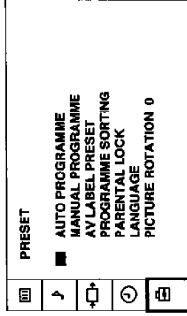
Note: Channels are automatically stored as follows:

KV-24WX1U/28WX1U
 Programme 1 BBC1
 Programme 2 BBC2
 Programme 3 ITV
 Programme 4 CH4 or S4C

Presetting Channels Manually

This function enables you to preset channels one by one to different programme numbers. This is also convenient for allocating programme numbers to various video input sources.

- 1 Press the MENU button **⏏**.
- 2 Press blue or green **⏏** to select the symbol **⏏** on the menu screen then press yellow **⏏**.



- 3 Press blue or green **⏏** to select 'MANUAL PROGRAMME' then press yellow **⏏**.

MANUAL PROGRAMME PRESET				
PROG	SYS	CHAN	LABEL	AFT
0	1	C39	.....	ON
1	1	C31	.....	ON
2	1	C32	.....	ON
3	1	C37	.....	ON
4	1	C41	.....	ON
5	1	C45	.....	ON
6	1	C46	.....	ON
7	1	C44	.....	ON
8	1	C43	.....	ON
9	1	C52	.....	ON

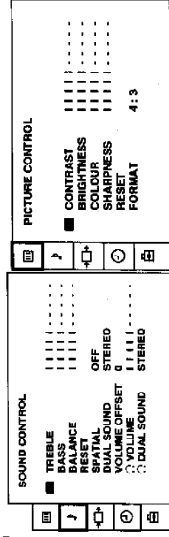
- 4 Press blue or green **⏏** to select on which programme number you want to preset a channel then press yellow **⏏**.
- 5 Press blue or green **⏏** to select the TV broadcast system 'I' or a video input source (AV1, AV2 ...) then press yellow **⏏**.
- 6 Press yellow **⏏**.
- 7 Select the first number digit of 'CHAN' (channel) then the second number digit of 'CHAN' with the number buttons **⏏** on the remote commander or Press blue or green **⏏** to search for the next available channel.

- 8 If you want to store the channel, go to step 9. If not, select a new channel using the number buttons **⏏** on the remote commander or press blue or green **⏏** to resume the search.
- 9 Press OK **⏏**.
- 10 Repeat steps 4 to 9 to preset other channels.
- 11 Press the MENU button **⏏** to restore the normal TV picture.

Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste.

- 1 Press the MENU button **⏏**.
- 2 Press blue or green **⏏** to select **⏏** for picture control or **⏏** for sound control then press yellow **⏏**.

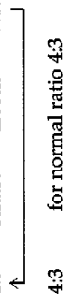


- 3 Press blue or green **⏏** to select the desired item then press yellow **⏏**.
- 4 Press red or yellow **⏏** to alter the item then press OK **⏏**. For the effect of each control, see the following tables.
- 5 Repeat steps 3 and 4 to adjust the other items.
- 6 Press the MENU button **⏏** to restore the normal TV picture.

Adjusting the Picture and Sound (continued)

PICTURE CONTROL Effect

- Contrast — | — Higher
- Brightness — | — Brighter
- Colour — | — More
- Sharpness — | — Sharper
- Hue — | — Reddish (NTSC signals only)
- Reset picture to the factory preset levels.
- 4:3 → Smart → Zoom → Wide



Smart for initiation of wide screen effect (16:9) for 4:3 broadcasts



Zoom for initiation of wide screen effect (16:9) for movies broadcast in cinematic format



Wide for 16:9 broadcasts

When 'Zoom' is selected, you can scroll the screen to see the cut-off part (e.g. subtitles) as follows:

- 1 Press blue **6** to select 'Scroll' then press yellow.
- 2 Press red or yellow **8** to scroll the picture upwards or downwards (-5 to +5) then press OK **6**.

Adjusting the Picture and Sound (continued)

SOUND CONTROL Effect

- Treble — | — More
- Bass — | — More
- Balance — | — Right
- Reset Resets sound to the factory preset levels.
- Spatial Acoustic sound effect.
- Dual Sound A: Left channel → B: Right channel → stereo → mono
- Volume Offset Presets the volume level for individual programmes.
- -12 — 0 — +12
- Volume Adjusts the headphone volume.
- Dual Sound Selects the headphone channels.
- A: Left channel → B: Right channel → stereo → mono

Manual Fine-Tuning

Normally, the automatic fine-tuning (AFT) function is operating. If the picture is distorted however, you can manually fine-tune the TV to obtain a better picture reception.

- 1 Press the MENU button **⏏**.
- 2 Press blue or green **⏏** to select the symbol **⏏** on the menu screen then press yellow **⏏**.

3 Press blue or green **⏏** to select 'MANUAL PROGRAMME' then press yellow **⏏**.

MANUAL PROGRAMME PRESET				
PROG	SYS	CHAN	LABEL	AFT
0	1	C26	----	ON
1	1	C27	----	ON
2	1	C28	----	ON
3	1	C29	----	ON
4	1	C30	----	ON
5	1	C31	----	ON
6	1	C32	----	ON
7	1	C33	----	ON
8	1	C34	----	ON
9	1	C35	----	ON

- 4 Press blue or green **⏏** to select the programme number which corresponds to the channel you want to manually fine-tune.
- 5 Press yellow **⏏** repeatedly until the AFT position changes colour.
- 6 Press blue or green **⏏** to fine-tune the channel frequency (-15 to +15).
- 7 Press OK **⏏**.
- 8 Repeat steps 4 to 7 to fine-tune other channels.
- 9 Press the MENU button **⏏** to restore the normal TV picture.

Sorting Programme Positions

This function enables you to exchange the programme positions.

- 1 Press the MENU button **⏏**.
- 2 Press blue or green **⏏** to select the symbol **⏏** on the menu screen then press yellow **⏏**.
- 3 Press blue or green **⏏** to select 'PROGRAMME SORTING' then press yellow **⏏**.
- 4 Press blue or green **⏏** to select the channel you want to exchange then press yellow **⏏**.
- 5 Press blue or green **⏏** to select the programme position of the channel you want exchanged then press yellow **⏏**.
- 6 Repeat steps 4 to 5 if you wish to exchange other programme positions.
- 7 Press the MENU button **⏏** to restore the normal TV picture.

PRESET	
⏏	AUTO PROGRAMME
⏏	MANUAL PROGRAMME
⏏	AV LABEL PRESET
⏏	PROGRAMME SORTING
⏏	PARENTAL LOCK
⏏	LANGUAGE
⏏	PICTURE ROTATION 0

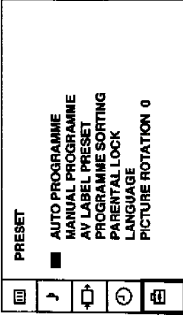
PROGRAMME SORTING		
PROG	SYS	CHAN
0	1	C26
1	1	C27
2	1	C28
3	1	C29
4	1	C30
5	1	C31
6	1	C32
7	1	C33
8	1	C34
9	1	C35

Using Parental Lock

This function enables you to prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

- 1 Press the MENU button **13**.
- 2 Press blue or green **8** to select the symbol **14** on the menu screen then press yellow **3**.

3 Press blue or green **8** to select 'PARENTAL LOCK' then press yellow **3**.



The screenshot shows a menu with the following options: PRESET, AUTO PROGRAMME, MANUAL PROGRAMME, AV LABEL PRESET, PROGRAMME SORTING, PARENTAL LOCK (highlighted), LANGUAGE, and PICTURE ROTATION 0. At the bottom are navigation buttons: back, up, down, left, and right.

- 4 Press blue or green **8** to select the channel you want to block then press yellow **3**.
The symbol **14** appears before the programme number to indicate that this channel is now blocked.

PARENTAL LOCK		
PROG	SYS	CHAN LABEL
0	1	C33 BBC-W
1	1	C34 BBC-2
2	1	C35 CHN-1
3	1	C36 CHN-2
4	1	C37 MY-CH
5	1	C38 VHS-1
6	1	C39 VHS-2
7	1	C40 RMN
8	1	C41
9	1	C42

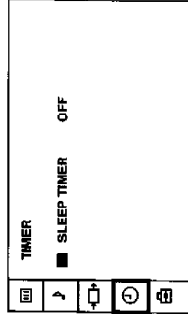
- 5 Repeat step 4 if you wish to block other channels.
- 6 Press the MENU button **13** to restore the normal TV picture.

Note: To unblock, press yellow **3** after selecting the channel to unblock in the 'PARENTAL LOCK' menu.

Using the Sleep Timer

This function enables you to select a time period after which the TV automatically switches into standby mode.

- 1 Press the MENU button **13**.
- 2 Press blue or green **8** to select the symbol **14** on the menu screen then press yellow **3**.



- 3 Press yellow **3**.
- 4 Press red or yellow **8** to set time delay and press OK **6**.

OFF 0:30 1:00 1:30 3:30 4:00
- 5 Press the MENU button **13** to restore the normal TV picture.

One minute before the TV switches into standby mode, a message is displayed on the screen.

Adjusting the Picture Rotation

If, due to the earth magnetism, the picture slants, you can use the function 'Picture Rotation' to readjust the picture.

- 1 Press the MENU button **6**.
- 2 Press blue or green **8** to select the symbol **6** on the menu screen then press yellow **8**.

PRESET	
<input checked="" type="checkbox"/>	AUTO PROGRAMME
<input type="checkbox"/>	MANUAL PROGRAMME
<input type="checkbox"/>	AV LABEL PRESET
<input type="checkbox"/>	PROGRAMME SORTING
<input type="checkbox"/>	PARENTAL LOCK
<input type="checkbox"/>	LANGUAGE
<input type="checkbox"/>	PICTURE ROTATION 0
- 3 Press blue or green **8** to select 'PICTURE ROTATION' then press yellow **8**.
- 4 Press red or yellow **8** to adjust the picture rotation then press OK **6**. The adjusting range is -5 to +5.
- 5 Press the MENU button **6** to restore the normal TV picture.

Skipping Programme Positions

This function enables you to skip unused programme positions when selecting them with the PROG+/- buttons. However, you can still watch the channel of the skipped programme position by using the number buttons.

- 1 Press the MENU button **6**.
- 2 Press blue or green **8** to select the symbol **6** on the menu screen then press yellow **8**.
- 3 Press blue or green **8** to select 'MANUAL PROGRAMME' then press yellow **8**.



PRESET	
<input checked="" type="checkbox"/>	AUTO PROGRAMME
<input type="checkbox"/>	MANUAL PROGRAMME
<input type="checkbox"/>	AV LABEL PRESET
<input type="checkbox"/>	PROGRAMME SORTING
<input type="checkbox"/>	PARENTAL LOCK
<input type="checkbox"/>	LANGUAGE
<input type="checkbox"/>	PICTURE ROTATION 0
- 4 Press blue or green **8** to select the programme position you want to skip then press yellow **8**.
- 5 Press blue or green **8** until '---' appears in the 'SYS' position.

MANUAL PROGRAMME PRESET			
PROG	SYS	CHAN	LABEL AFT
0	---	C39	---
1	---	C31	---
2	---	C32	---
3	---	C36	---
4	---	C37	---
5	---	C40	---
6	---	C41	---
7	---	C42	---
8	---	C39	---
9	---	C32	---
- 6 Press OK **6**.
- 7 Repeat steps 4 to 6 to skip other programme positions.
- 8 Press the MENU button **6** to restore the normal TV picture.


Captioning a Station Name


Names for channels are usually automatically taken from teletext if available. You can however name a channel or an input video source using up to five characters (letters or numbers).


- Press the MENU button **1**.
- Press blue or green **2** to select the symbol  on the menu screen then press yellow **3**.






PRESET










































































































































































































































































































































































































































































































































































































































































Favourite page system

You can store up to four of your favourite teletext pages per Teletext service. In this way you have quick access to the pages you frequently use.

Storing pages

- 1 Use the number buttons **4** to select the page you would like to store.
- 2 Press **↔** **7** twice.
The colour prompts at the bottom of the screen flash.
- 3 Press red, green, blue or yellow **6** to store the selected page.
The page is now stored on this colour.

Repeat steps 1 to 3 for the other 3 pages.

Displaying the Favourite Pages

- 1 Press **↔** **7**.
- 2 Press red, green, blue or yellow **6** to select the desired page.
Make sure you press **↔** **7**, otherwise the normal Fastext facility operates.

Using Fastext




(only available, if the TV station broadcasts Fastext signals)

With Fastext you can access pages with one key stroke. When Fastext is broadcast, a colour-coded menu appears at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue colours on the Remote Commander.


Press the colour button **6** that corresponds to the colour-coded menu. The selected page is displayed after some seconds.

Connecting Optional Equipment

There is a wide range of optional equipment you can connect to your TV. Refer to the illustrations on the front flap page of this manual.

Symbol	Acceptable input signals	Available output signals
	Normal audio/ video and RGB	Audio/ video from TV tuner
	Normal audio/ video and S video	Audio/ video from selected source
	Normal audio/ video and S video	No output

Connecting Headphones

Plug in the headphones to the  socket **A** on the front of the TV.

About S video input

Video signals may be separated into Y (luminance) and C (chrominance) signals. Separating the two signals prevents interference and thus improves the picture quality.

Notes on connections:

- If the picture or sound is distorted, move the VCR away from the TV.
- When connecting a monaural VCR, connect only the white jack to both the TV and VCR.
- Select 'TV' for output in the 'VIDEO CONNECTION' menu if you connect a decoder to **2** / **2 L** (see page 30).

Selecting Input and Output Signals

This section explains how to select the output signal from **C-2/-S 2** and how to select and view the input. You can use direct access buttons **⏮** **⏭** to select the input or the menu system to select input and output.

Selecting Input Signals With Direct Access Buttons

Press **⏮** **⏭** repeatedly.

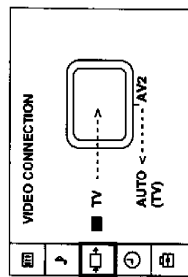
Press **⏮** to restore the normal TV picture.

Symbol on the screen	Input Signal
⏮ 1	Audio/video through Euro AV connector K
⏮ 2	RGB through Euro AV connector K
⏮ 2	Audio/video through Euro AV connector L
⏮ 2	S video through Euro AV connector L
⏮ 3	Audio/video through the phono jacks C
⏮ 3	S video through the 4 pin DIN B

Selecting With the Video Connection Menu

1 Press the MENU button **⏮**.

2 Press blue or green **⏮** to select **VIDEO CONNECTION** then press yellow **⏮**.



3 Press blue or green to select input (for the TV screen) or output (for **C-2/-S 2**) then press yellow **⏮**.

4 Press red or yellow repeatedly to select the desired input or output source then press OK **⏮**.

5 Press the MENU button **⏮** to restore the normal TV picture.

Note: If you select 'AUTO' for output, the output source automatically becomes the same as the desired input source.

Using AV Label Preset

This function enables you to label the input sources using up to five characters (letters or numbers).

1 Press the MENU button **⏮**.

2 Press blue or green **⏮** to select the symbol **⏮** on the screen then press yellow **⏮**.

3 Press blue or green **⏮** to select 'AV LABEL PRESET' then press yellow **⏮**.

AV LABEL PRESET	
INPUT	LABEL
AV1
RGB
AV2
YC2
AV3
YC3

4 Press blue or green **⏮** to select the desired input source then press yellow **⏮**.

5 Press blue or green **⏮** to select a letter or number then press yellow **⏮** (select '.' for a blank).
Select the other four characters in the same way.

6 After selecting all the characters, press OK **⏮**.

7 Repeat steps 4 to 6 to label other input sources.

8 Press the MENU button **⏮** to restore the normal TV screen.

Troubleshooting

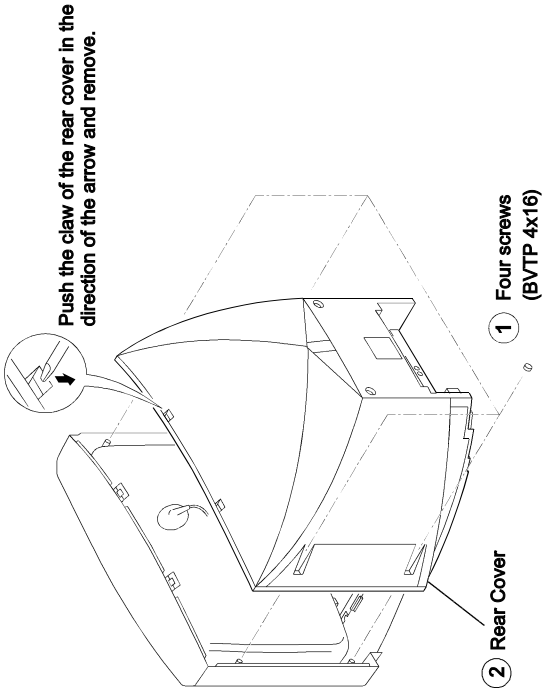
Here are some simple solutions to the problems which affect the picture and sound.

Problem	Solution
No picture (screen is dark), no sound	<ul style="list-style-type: none"> • Plug the TV in. • Press 1 on the TV. (If 1 indicator is on, press 2 or a programme number 4 on the Remote Commander.) • Check the aerial connection. • Check if the selected video source is on. • Turn the TV off for 3 or 4 seconds then turn it on again using 1.
Poor or no picture (screen is dark), but good sound	<ul style="list-style-type: none"> • Press MENU 3 to enter the 'PICTURE CONTROL' menu and adjust 'Contrast', 'Brightness' and 'Colour'.
Poor picture quality when watching an RGB video source.	<ul style="list-style-type: none"> • Press 2 1 2 repeatedly to select 2.
Good picture but no sound	<ul style="list-style-type: none"> • Press 2 + 2 2. • If 2 is displayed on the screen, press 2.
No colour for colour programmes	<ul style="list-style-type: none"> • Press MENU 3 to enter the 'PICTURE CONTROL' menu, select 'Reset' then press OK 2.
Remote Commander does not function.	<ul style="list-style-type: none"> • Replace the batteries.

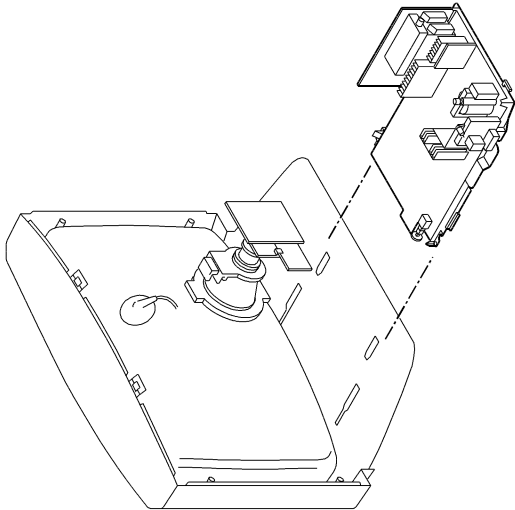
If you continue to have problems, have your TV serviced by qualified personnel. Never open the casing yourself.

SECTION 2
DISASSEMBLY

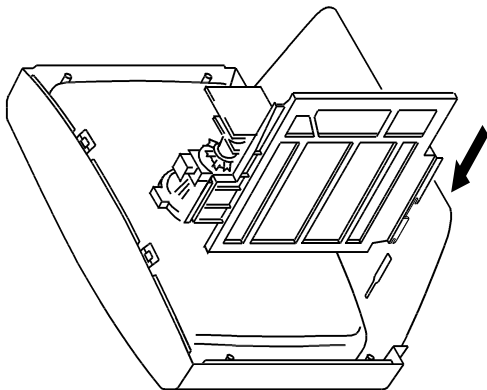
2-1. REAR COVER REMOVAL



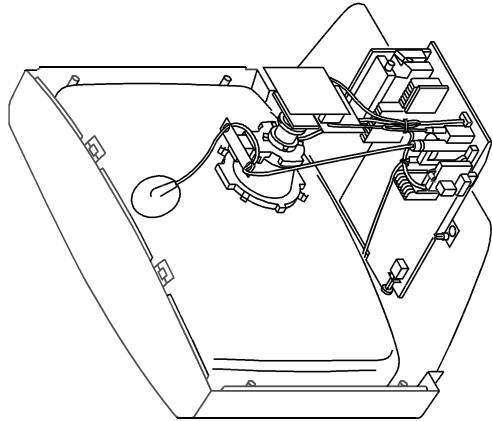
2-2. CHASSIS ASSY REMOVAL



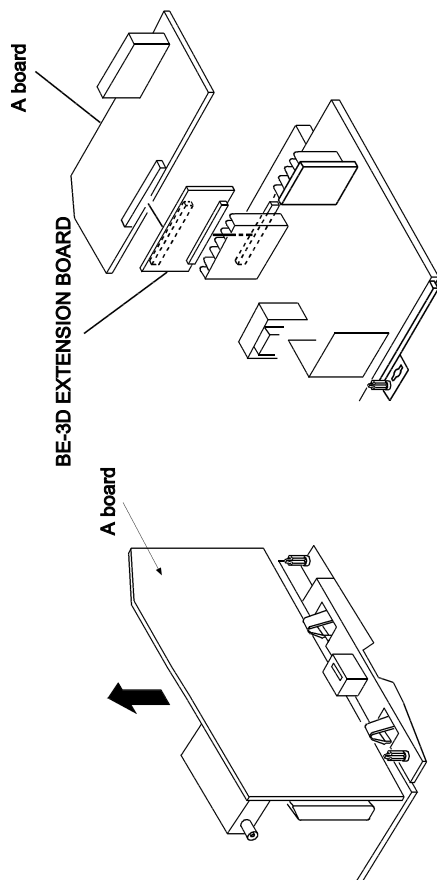
2-3. SERVICE POSITION



2-4. WIRE DRESSING

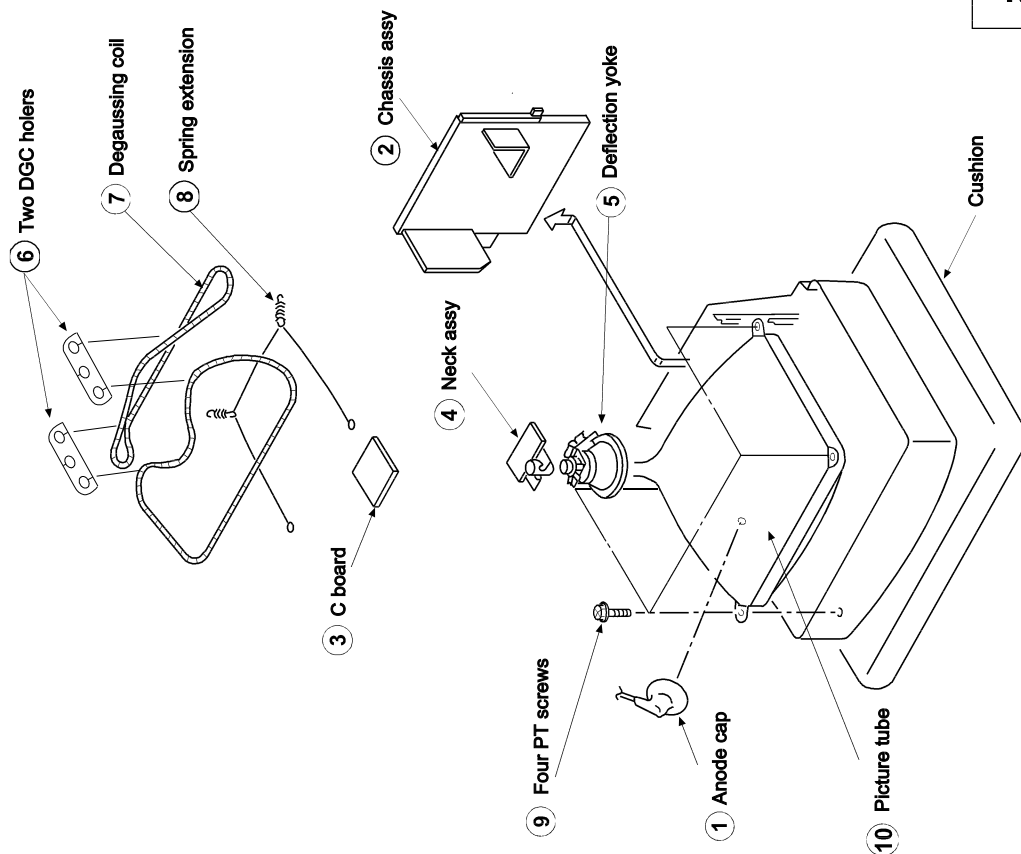


2-5. A BOARD REMOVAL



2-6. A EXTENSION BOARD

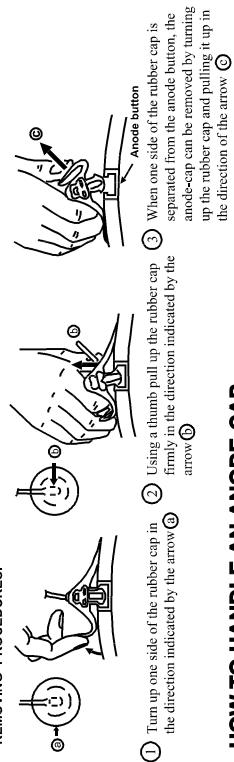
2-7. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* REMOVING PROCEDURES.



• HOW TO HANDLE AN ANODE-CAP

- ① Don't damage the surface of anode-cap with sharp shaped material !
- ② Don't press the rubber hardly not to hurt inside of anode-caps !
- ③ A metal fitting called as shatter-hook terminal is built into the rubber.
Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



REMOVAL AND REPLACEMENT OF THE MAIN-BRACKET BOTTOM PLATES.

(1) REMOVING THE PLATES

In the event of servicing being required to the solder side of the D Board printed circuit, the bottom plates fitted to the main chassis bracket require to be removed. This is performed by cutting the gates with a sharp wire cutter at the locations shown and indicated by arrows.

Note : There are 5 plates fitted to the main bracket and secured by 4 or 6 gates. Only remove the necessary plate to gain access to the circuit board.

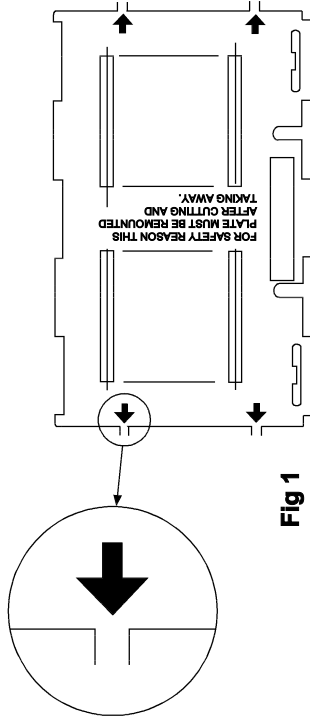


Fig 1

! For safety reasons, on no account should the plates be removed and not refitted after servicing.

(2) REFITTING THE PLATES

Because the plates differ in size it is important that the correct plates are refitted in their original location.

The plates are identified by markings A-B-C-D-E on their top side.

1. Identify the plate by locating its marking.
2. Turn the plate over noting where the marking is located.
3. Locate the corresponding marking indicated on the main chassis bracket. See Fig 2.
4. Refit the plate as indicated in Fig 3 with the markings located next to each other.

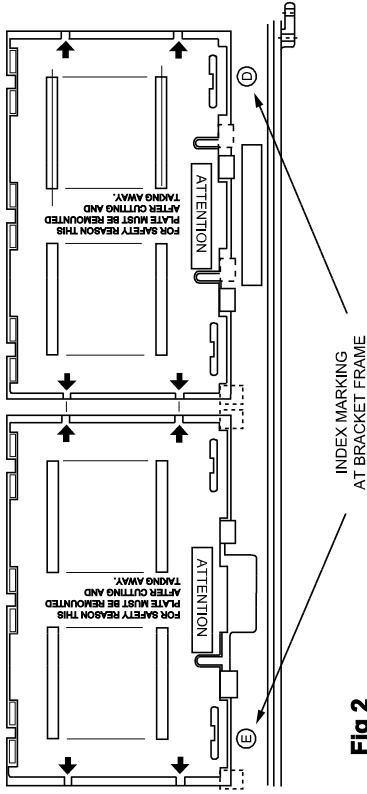


Fig 2

In the event of the plates requiring to be removed at a later stage, this can be achieved by inserting a screwdriver in the snap-recess indicated as in Fig 4 and lifting out.

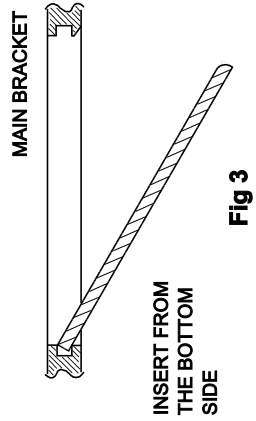


Fig 3

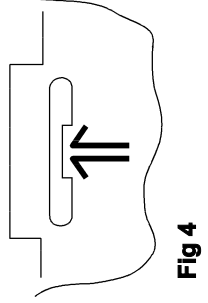


Fig 4

SECTION 3

SET - UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there are specific instructions to the contrary, carry out these adjustments with the rated power supply.
- Unless there are specific instructions to the contrary, set the controls and switches to these settings :

Ⓢ Contrast 80% (or remote control normal)
 ☼ Brightness 50%

- Carry out the following adjustments in this order :

1. Beam landing
2. Convergence
3. Focus
4. White balance

Note: Testing equipment required.

1. Color bar/pattern generator
2. Degausser
3. DC power supply
4. Digital multimeter
5. Oscilloscope

Preparation:

- In order to reduce the influence of geomagnetism on the set's picture tube, face it east or west.
- Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input the white signal with the pattern generator.
 CONTRAST } normal
 BRIGHTNESS }
2. Position neck assy as shown in Fig.3-2.
3. Set the pattern generator raster signal to red.
4. Move the deflection yoke forward and adjust with the purity control so that the red is at the centre and the blue and the green take up equally sized areas on each side. (See Fig. 3-1 - 3-3)
5. Move the deflection yoke forward and adjust so that the entire screen becomes red. (See Fig. 3-1)
6. Switch the raster signal to blue, then to green and verify the condition.
7. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws.
8. If the beam does not land correctly in all the corners, use a magnet to adjust it. (See Fig. 3-4)

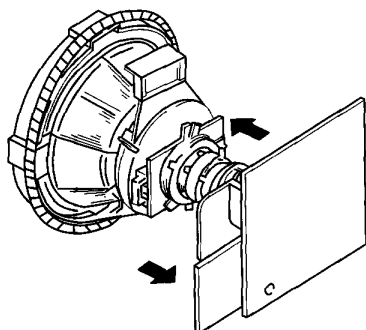


Fig. 3-1

Fig. 3-2

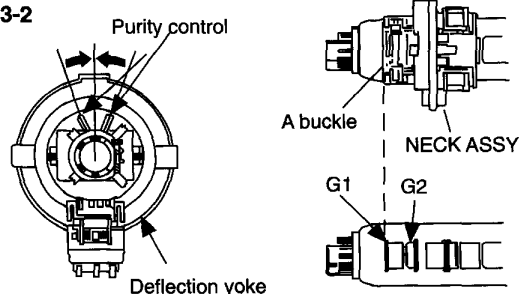


Fig. 3-3

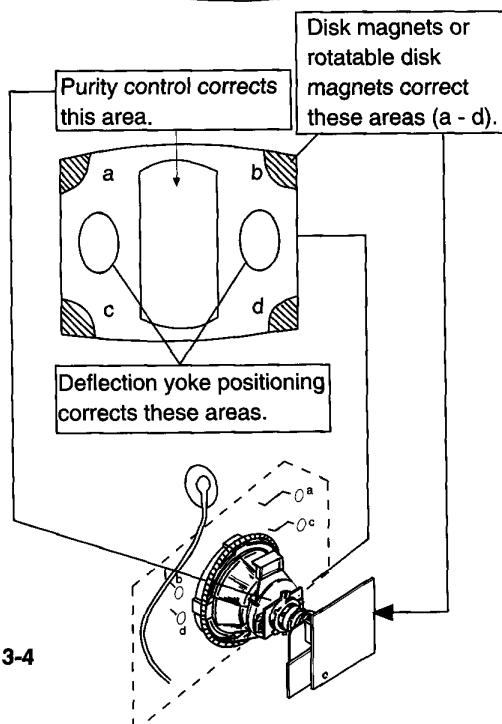
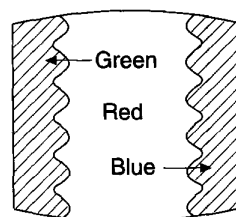


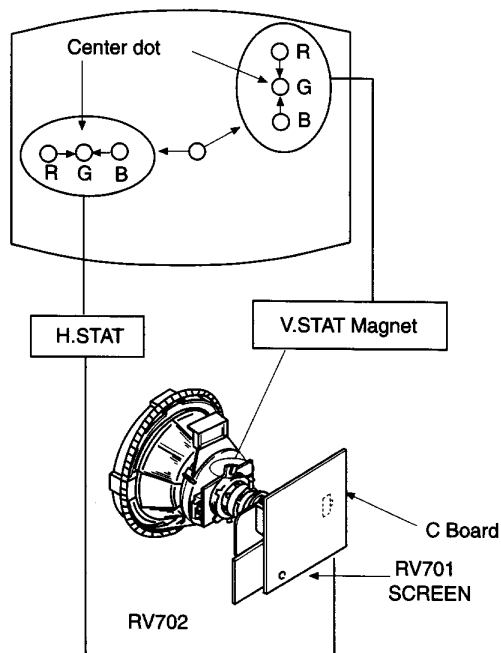
Fig. 3-4

3-2. CONVERGENCE

Preparation:

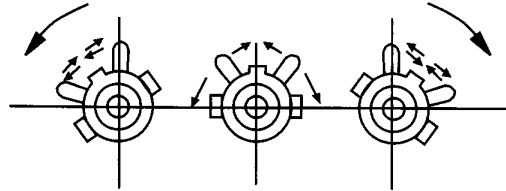
- Before starting this adjustment, adjust the focus, horizontal size, and vertical size.
- Minimize the brightness setting.
- Provide a dot pattern.

(1) Horizontal and vertical static convergence

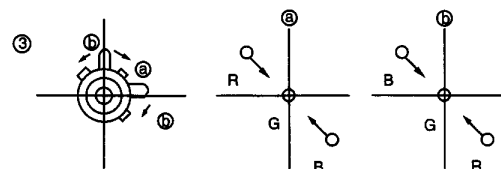
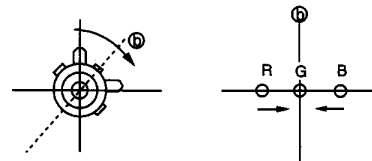
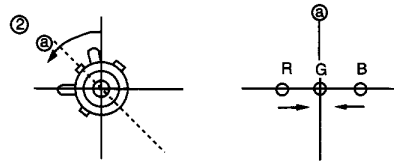
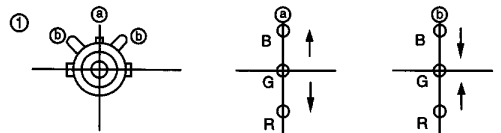


1. (Moving horizontally), adjust the H.STAT control so that the red, green, and blue points are on top of each other at the centre of the screen.
2. (Moving vertically), adjust the V.STAT magnet so that the red, green, and blue points are on top of each other at the centre of the screen.
3. If the H.STAT variable resistor cannot bring the red, green, and blue points together at the centre of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V.STAT magnet in the manner given below.
(In this case, the H.STAT variable resistor and the V.STAT magnet influence each other)

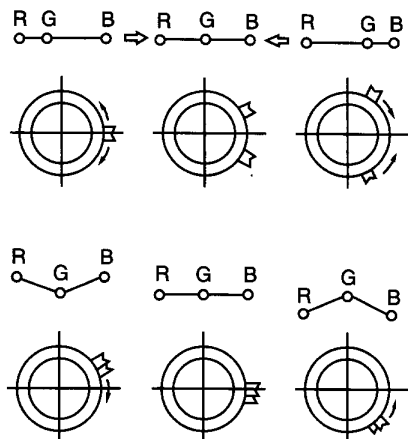
- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.



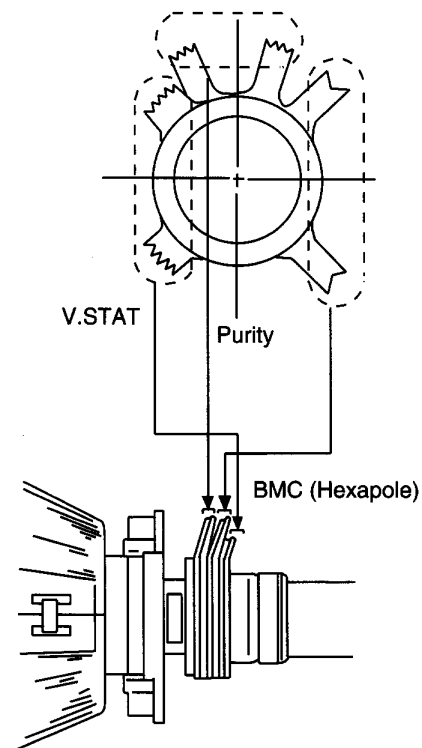
4. If the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the red, green, and blue points move as shown below.



- Operation of BMC (Hexapole) Magnet



- The respective dot position resulting from moving each magnet interact, so be sure to perform adjustment while tracking.
Use the H.STAT VR to adjust the red, green, and blue dots so they coincide at the centre of the screen (by moving the dots in the horizontal direction).

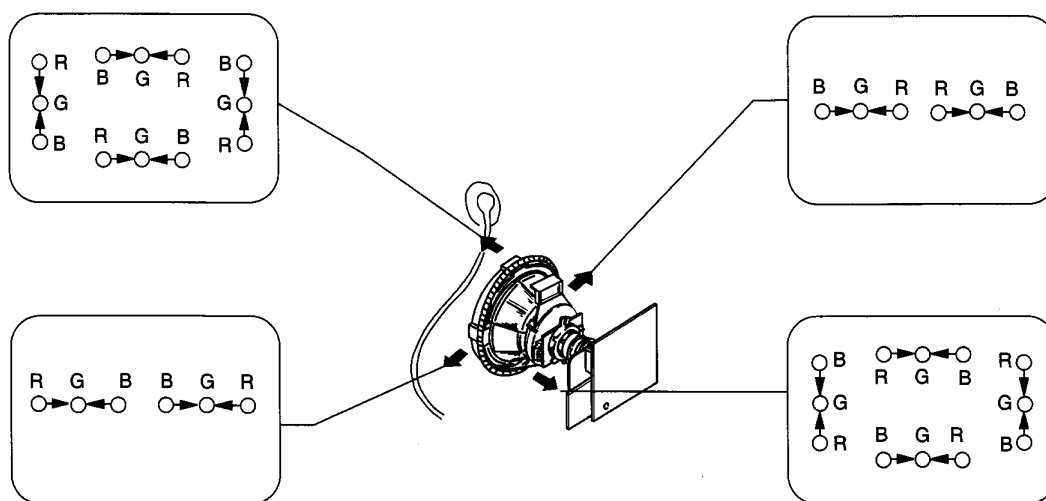


(2) Dynamic convergence adjustment.

Preparation:

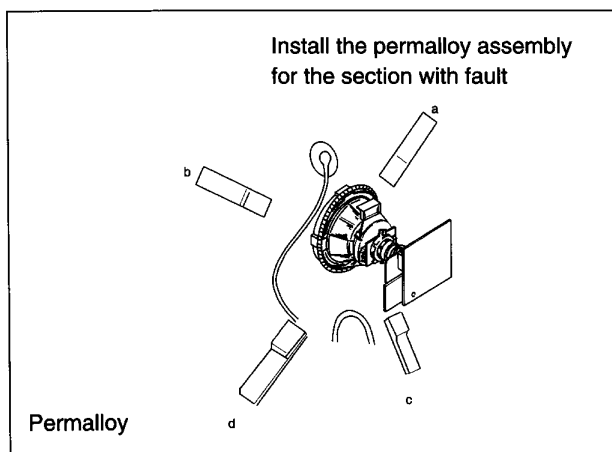
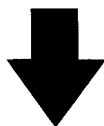
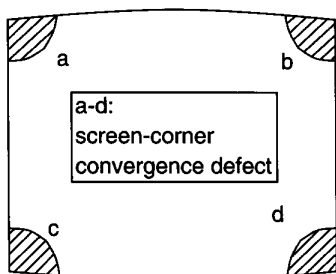
- Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence.
- Slightly loosen the deflection yoke screws.

- Remove the deflection yoke spacer.
- Move the deflection yoke as shown in the figure below and optimize the convergence.
- Tighten the deflection yoke screws.
- Re-install the deflection yoke spacer.



(3) Screen corner convergence.

If you are unable to adjust the corner convergence properly, correct them with the use of permalloy assemblies.

**3-3. WHITE BALANCE****G2 Setting**

1. Switch the set into AV mode (apply no signal to the AV connectors).
2. Connect a Volt Meter to Test Point 1 on the A board.
3. Adjust RV01 to obtain a voltage of $3.0V \pm 0.3V$.

White balance adjustment

1. Input an all white signal from the pattern generator.
2. Enter into the service mode.
3. Enter into Picture Adjustment service menu.
4. Select sub-contrast and adjust to 7.
5. Select the Green Drive and adjust so that the white balance becomes optimum.
6. Select the Blue Drive and adjust so that the white balance becomes optimum.
7. Press the TV button to return to TV operation.

PICTURE ADJUSTMENT

AFC mode	1
REF position	2
SCP BGR	1
SCP BGF	1
Trap Fo	0
Sub contrast	Adj
Sub colour	Adj
Sub brightness	Adj
Sub hue	Adj
Green drive	Adj
Blue drive	Adj
Green cutoff	Adj
Blue cutoff	Adj
Gamma	0
Pre / overshoot	0
Y delay	3

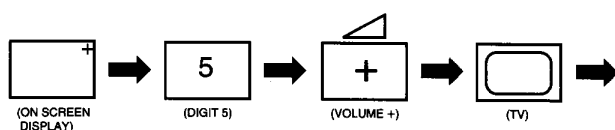
SECTION 4 CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied remote commander RM-839.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch of the set and enter into standby mode.
2. Press the following sequence of buttons on the Remote Commander.



"TT--" will appear in the top right corner of the screen. Other status information will also be displayed.

3. Press MENU on the commander to obtain the following menu on the screen.

TEST MENU

> Picture adjustment
Geometry
Wide
MSP
IC status
Current TV status

4. Move to the corresponding adjustment using the ↓ button on the commander.
5. Press the + button to enter the selected adjustment.
6. Turn off the power to quit the service mode when adjustments are completed.

PICTURE ADJUSTMENT

AFC mode	1
REF position	3
SCP BGR	1
SCP BGF	1
Trap Fo	7
Sub contrast	Adj
Sub colour	Adj
Sub brightness	Adj
Sub hue	Adj
Green drive	Adj
Blue drive	Adj
Green cutoff	Adj
Blue cutoff	Adj
Gamma	0
Pre / overshoot	0
Y delay	5

GEOMETRY ADJUSTMENT

V Size	Adj
V Position	Adj
S Correction	Adj
V Linearity	Adj
H Size	Adj
H Position	Adj
Pin Amp	Adj
Pin Phase	Adj
AFC Bow	Adj
AFC Angle	Adj
EHT V	Adj
EHT H	Adj
Corner Pin	Adj

WIDE

V Aspect	43
V Scroll	31
Upper V Lin	0
Lower V Lin	0
Left Blanking	1
Right Blanking	11

MSP

AGC ON/OFF	ON
Constant gain CDB	0
FM prescale FMP	36
Zwei mono-st WHI	36
Zwei st-mono WLO	18
Zwei mono-bi WMH	36
Zwei bi-mono WLO	18
Time zwei WML	41
Fawct limit	10
Fawct soll init FAW	12
Fawer tol	2
Nicam Err Max CCT	10
Nicam Err Min	0
Nicam Prescale NIP	97
Time Nicam	31
Carrier mute CRM	OFF
Audio clock ACO	HIZ
Scart prescale	25
Scart volume	64

IC STATUS (CXA2000 / CXA2040)**CXA2000**

H lock	1
IKR	1
VNG	0
X-RAY	0
Colour system	3
CV1 Sync	1

CXA2040

Sync sep	1
S1 mode pin	01
S2 mode pin	01

TUNER

Tuner status	01101011
--------------	----------

TV STATUS

Text system	C TEXT/TV TEXT
Dolby	NO/YES
Text language set	WEST/EAST/RUSSIAN
Menu language set	WEST/EAST/RUSSIAN
Destination	B/D/U/K/L/E/A/R
Scart 16:9	OFF/ON
RGB priority	OFF/ON
Ageing	OFF/ON
Size	29/25
Colour trap sw	SECAM/ALL
Velocity mod	ON/OFF
AFT STATUS	WINDOW/HIGH/LOW

SUB BRIGHTNESS ADJUSTMENT

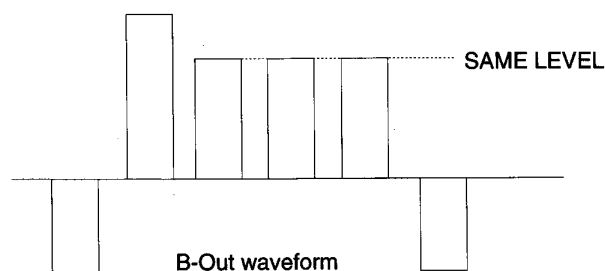
1. Input a Phillips pattern.
2. Set the picture control to minimum.
3. Enter into the Picture Adjustment Service Menu.
4. Adjust the Sub-Brightness data so that there is barely a difference between the 0 IRE and 10 IRE signal.

SUB CONTRAST ADJUSTMENT

1. Input a video that contains a small 100% area on a black background.
2. Set the picture control to maximum.
3. Connect an oscilloscope to pin 3 of CN301 (A board).
4. Enter into the Picture Adjustment Service Menu.
5. Adjust the Sub-contrast data to obtain a black to white amplitude of 2.50 volts.

SUB COLOUR ADJUSTMENT

1. Receive a PAL Colour Bar video signal.
2. Connect an oscilloscope to pin 3 of CN301 (A board).
3. Enter into the Picture Adjustment Service Menu.
4. Adjust the sub colour data so that cyan, magenta and blue colour bars are of equal height.



NOTE: The data shown in the TV STATUS table is dependant on destination, screen size and country.

SYSTEM B/G, D/K, I & L I.F. ADJUSTMENT

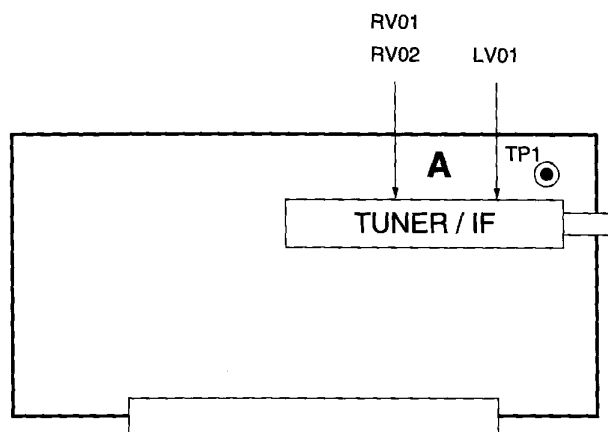
1. Input an off air signal of between 60-100dBuV / 75 ohm terminated, via the tuner socket.
2. Enter into the I.F adjustment service mode (i.e. " TT 59 ") to fix the I.F frequency to 38.9 MHz.
3. Enter into the service mode and select "Current TVStatus".
4. Adjust the I.F coil (LV01) until the "AFT Status" indicates a " Window " condition.

SYSTEM L BAND 1 I.F. ADJUSTMENT

1. Input an off air signal of between 60-100dBuV / 75 ohm terminated, via the tuner socket.
2. Enter into the I.F adjustment service mode (i.e. " TT 59 ") to fix the I.F frequency to 34.2 MHz.
3. Enter into the service mode and select "Current TVStatus".
4. Adjust the RV02 until the "AFT Status" indicates a " Window " condition.

TUNER AGC ADJUSTMENT

1. Receive a signal of 63dBuV / 75 ohm terminated via the tuner socket.
2. Measure the voltage at test point 1 (A board).
3. Adjust RV01 to obtain a voltage of $3.0V \pm 0.3V$.



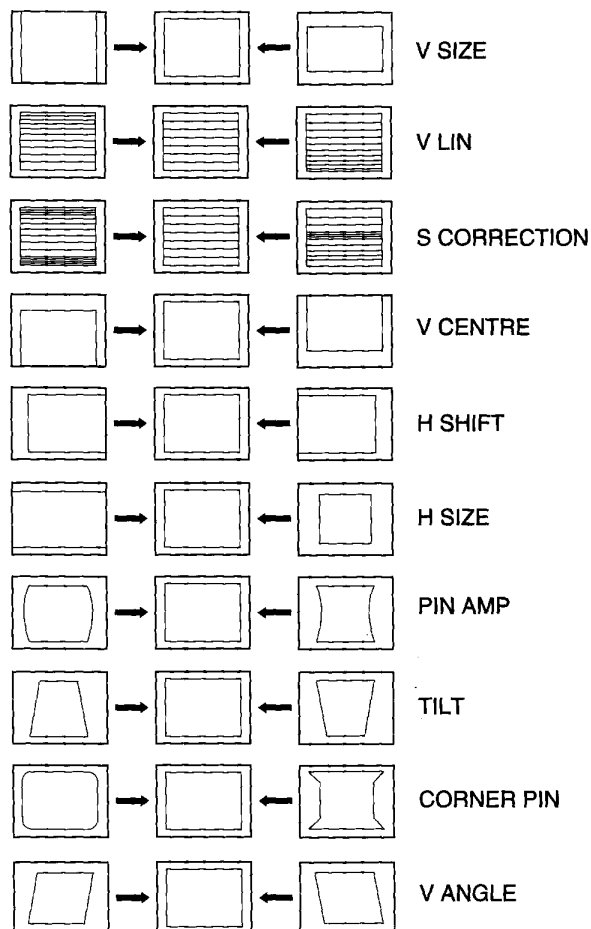
- A Board component side -

DEFLECTION SYSTEM ADJUSTMENT

1. Enter into the Geometry Adjustment Service Menu.
2. Select and adjust each item in order to obtain the optimum image.

GEOMETRY ADJUSTMENT

V Size	Adj
V Position	Adj
S Correction	Adj
V Linearity	Adj
H Size	Adj
H Position	Adj
Pin Amp	Adj
Pin Phase	Adj
AFC Bow	Adj
AFC Angle	Adj
EHT V	Adj
EHT H	Adj
Corner Pin	Adj



4-2. TEST MODE 2:

Is available by pressing Test button twice, OSD " TT " appears. The functions described below are available by pressing the two numbers. To release the Test mode 2, press 0 twice, or switch the TV into stand-by mode.

00	Switch test mode 2 off
01	Picture maximum
02	Picture minimum
03	Volume 30%
04	Set service menu mode
05	Set production menu mode
06	Volume 80%
07	Set ageing condition
08	Set shipping condition
09	Language reset
10	No function
11	Adjustment without OSD
12	Dummy
13	Display TV configuration
14	Forced AV 6:9 mode
15	Reset LPM from ROM data
16	copy LPM to reset memory
17	Preset label for AV sources
18	RGB priority on/off
19	Clear all preset labels
20	No function
21	Sub contrast
22	Sub colour
23	Sub brightness
24	Set destination = U
25	Set destination = D
26	Set destination = B
27	Set destination = K
28	Set destination = L
29	Set destination = E
30	No function
31	Set destination =A
32	Dummy
33	Auto AGC
34	Dummy
35	Manual AGC adjust

36-40	Dummy
41	Re-initialise NVM
42	Production use only
43	Initialise geometry settings
44	Initialise all favourite pages = 100
45	Channel locks = off
46	Dealer commander mode
47	Default MSP settings
48	Restore NVM test byte
49	Delete NVM test byte
50-60	No function
61	Turn on Dolby Pro Logic mode
62	White noise to left speaker
63	White noise to right speaker
64	White noise to centre speaker
65	White noise to rear speaker
66	Set standard stereo mode
67	Set Pro Logic normal mode
68	Set Pro Logic wide mode
69	Set Pro Logic phantom mode
70	No function
71	Picture rotation on/off
72	Dolby register settings
74	No function
75	Reset picture colour balance
76	Reset picture geometry
77	Reset sound settings
78	Reset error codes in the NVM
79-99	No function

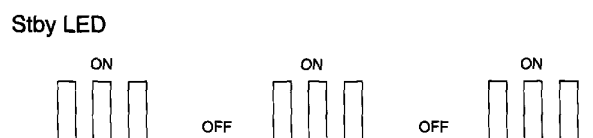
4-3. BE-3D SELF DIAGNOSTIC SOFTWARE

The identification of errors within the BE-3D chassis is triggered in 1 of 2 ways :- 1: Bus busy or 2: Device failure to respond to IIC. In the event of one of these situations arising the software will first try to release the bus if busy (Failure to do so will report with continuous flashing LED) and then communicate with each device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the led (Series of flashes which must be counted) See Table 1, non fatal errors are reported with this method.

Table 1

ERROR	LED ERROR COUNT
Protection circuit trip < ANY TIME >	02
IIC SCL LOW < POWER UP ONLY >	03
IIC SDA LOW < POWER UP ONLY >	04
IIC SDA & SCL LOW < POWER UP ONLY >	05
Jungle/Chroma controller no acknowledge < POWER UP ONLY >	06
Video Switch no acknowledge < POWER UP ONLY >	07
Tuner no acknowledge	08
MSP no acknowledge	09
NVM no acknowledge	10
M3L TXD LOW < POWER UP ONLY >	11
M3L RXD LOW < POWER UP ONLY >	12
M3L ENABLE LOW < POWER UP ONLY >	13
M3L TXD & RXD LOW < POWER UP ONLY >	14
Compact Text test fail < POWER UP ONLY >	15
AV switch cannot power on reset	16
Cannot initialise jungle	17
NVM acknowledge fail after initialisation	18
Multiple devices with no acknowledge < POWER UP ONLY >	19
Compacttext run-time failure	20
AVSWITCH response failure after power up	21
JUNGLE/CHROMA controller response failure after power up	22
CompactText does not respond	23

Flash Timing Example : e.g. error number 3.



4-3. BE-3D SELF DIAGNOSTIC SOFTWARE

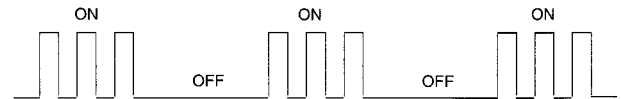
The identification of errors within the BE-3D chassis is triggered in 1 of 2 ways :- 1: Bus busy or 2: Device failure to respond to IIC. In the event of one of these situations arising the software will first try to release the bus if busy (Failure to do so will report with continuous flashing LED) and then communicate with each device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the led (Series of flashes which must be counted) See Table 1, non fatal errors are reported with this method.

Table 1

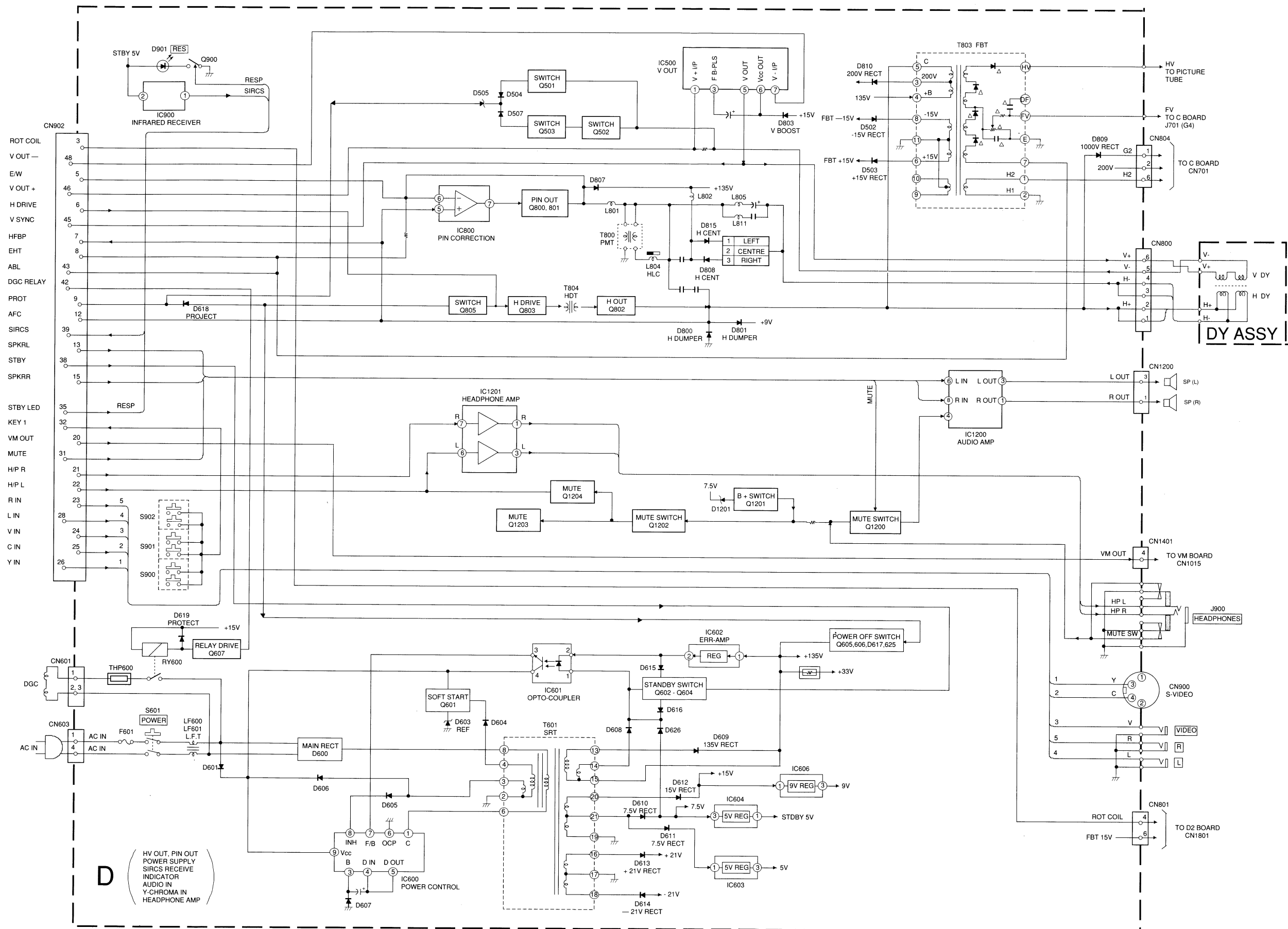
ERROR	LED ERROR COUNT
Protection circuit trip < ANY TIME >	02
IIC SCL LOW < POWER UP ONLY >	03
IIC SDA LOW < POWER UP ONLY >	04
IIC SDA & SCL LOW < POWER UP ONLY >	05
Jungle/Choroma controller no acknowledge < POWER UP ONLY >	06
Video Switch no acknowledge < POWER UP ONLY >	07
Tuner no acknowledge	08
MSP no acknowledge	09
NVM no acknowledge	10
M3L TXD LOW < POWER UP ONLY >	11
M3L RXD LOW < POWER UP ONLY >	12
M3L ENABLE LOW < POWER UP ONLY >	13
M3L TXD & RXD LOW < POWER UP ONLY >	14
Compact Text test fail < POWER UP ONLY >	15
AV switch cannot power on reset	16
Cannot initialise jungle	17
NVM acknowledge fail after initialisation	18
Multiple devices with no acknowledge < POWER UP ONLY >	19
Compacttext run-time failure	20
AVSWITCH response failure after power up	21
JUNGLE/CHROMA controller response failure after power up	22
CompactText does not respond	23

Flash Timing Example : e.g. error number 3.

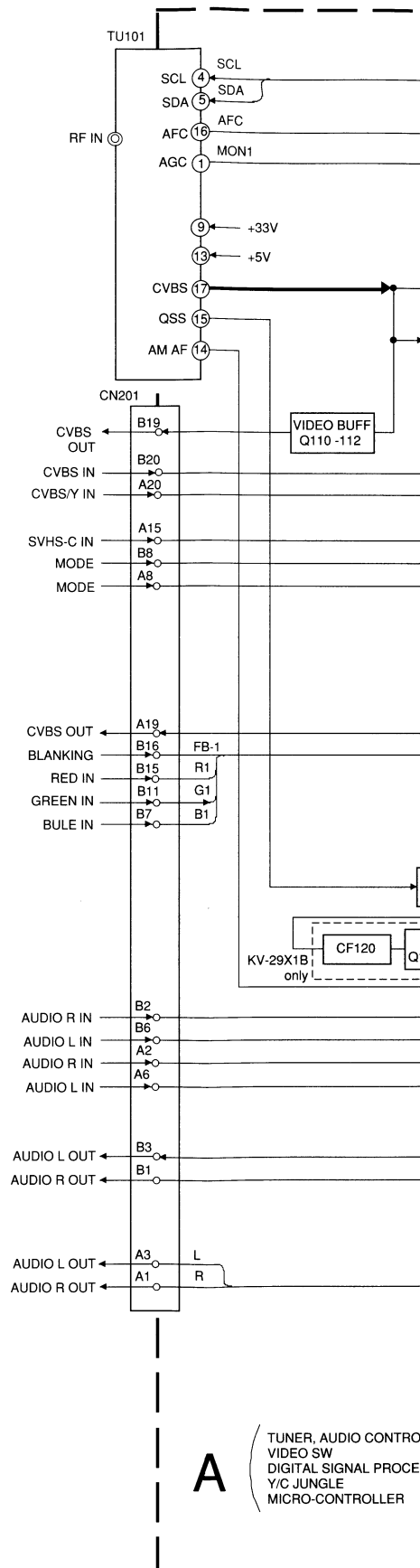
Stby LED



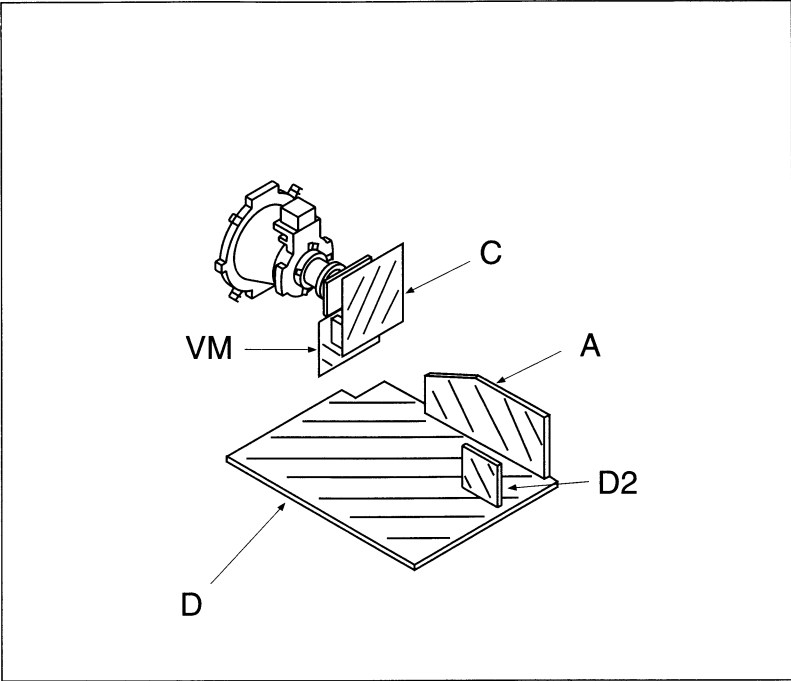
5-1. BLOCK DIAGRAM (1)



BLOCK DIAGRAM (2)



5-2. CIRCUIT BOARDS LOCATION







5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS


Note :

- All capacitors are in μF unless otherwise noted. pF: μpF
50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power $\frac{1}{4}$ W



-  : nonflammable resistor.
-  : internal component.
-  : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- \perp : earth - ground.
- /// : earth - chassis.
- $\#$: no mounted.

Note : The components identified by shading and marked  are critical for safety. Replace only with the part number specified.

Note : Les composants identifiés par une trame et une marque  sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

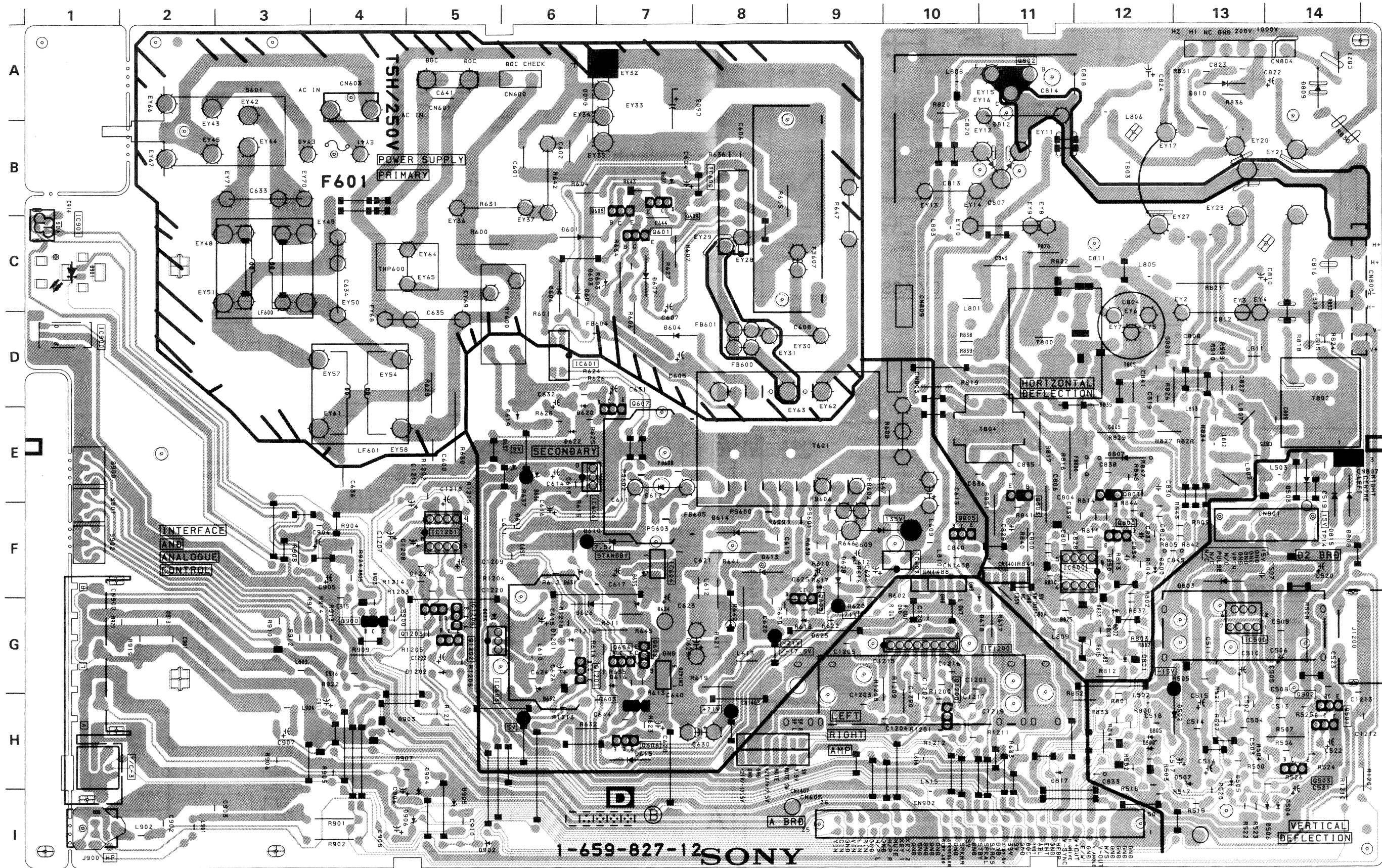
Reference information

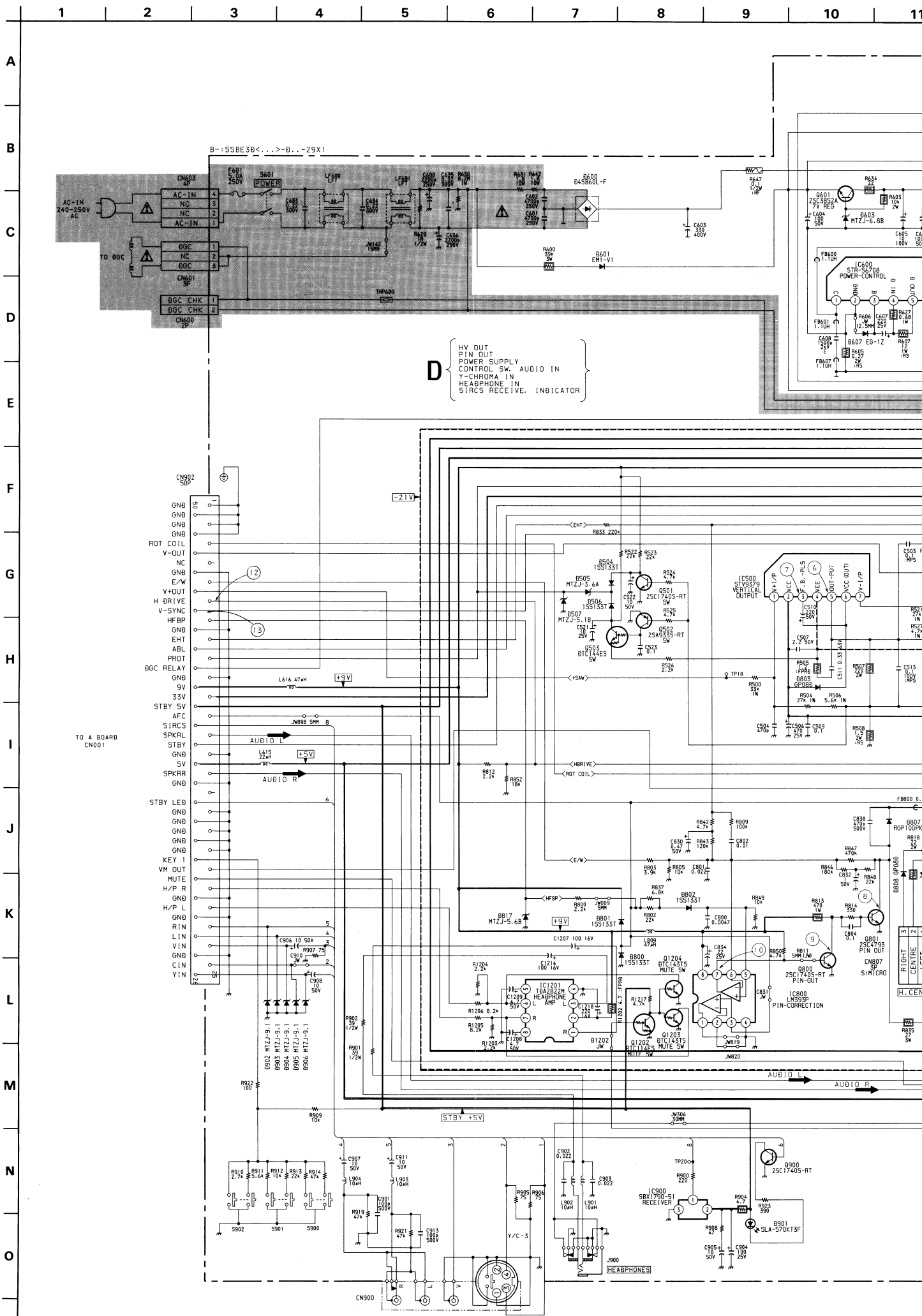
RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
COIL	: \times	ADJUSTABLE RESISTOR
	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

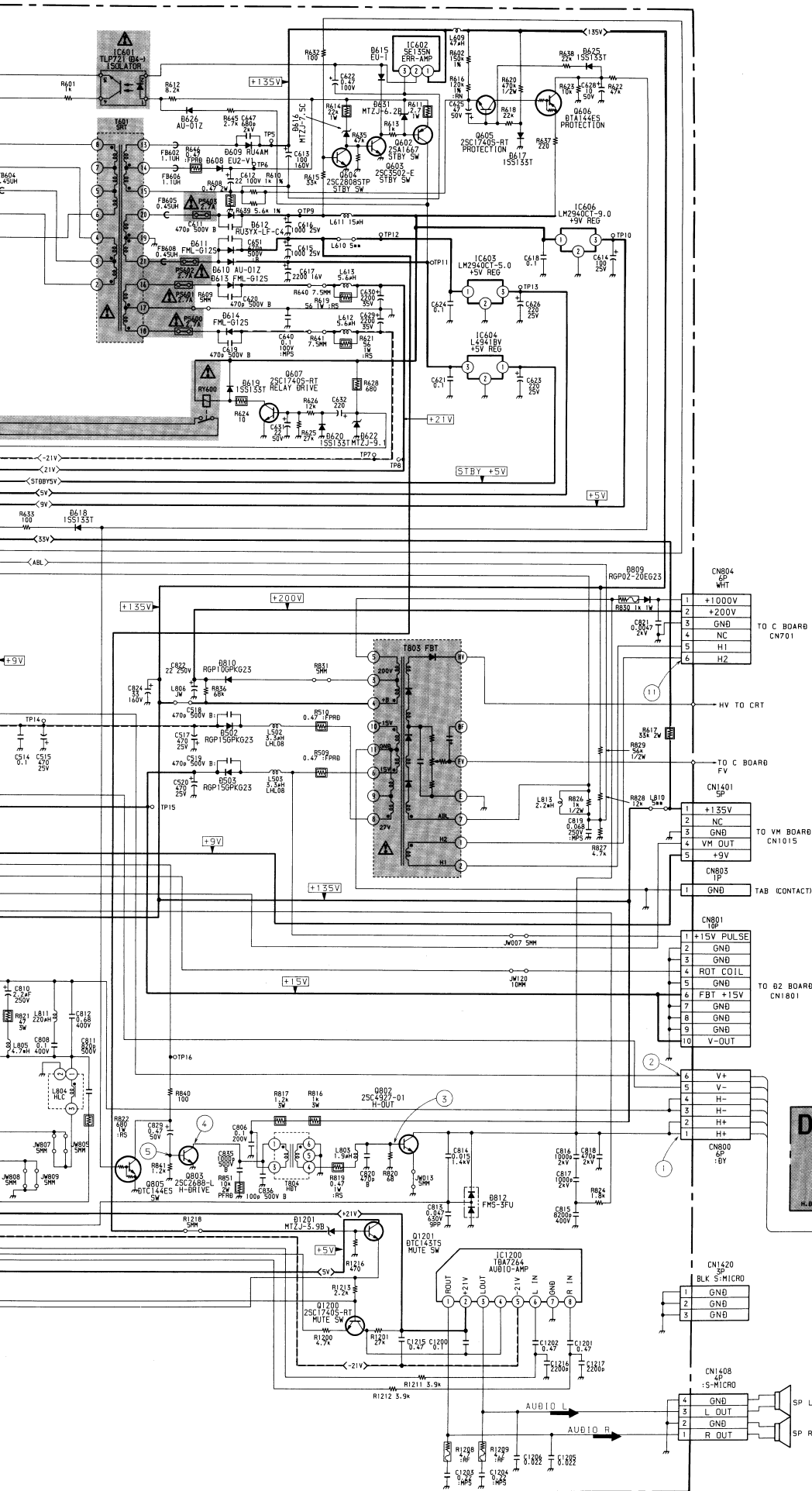
- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M Ω digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
-  : B+ bus.
-  : signal path. (RF)

D HV OUT, PIN OUT, POWER SUPPLY, CONTROL SW, AUDIO IN
Y-CHROMA IN, HEADPHONE IN, SIRCS RECEIVE, INDICAITON

D Board





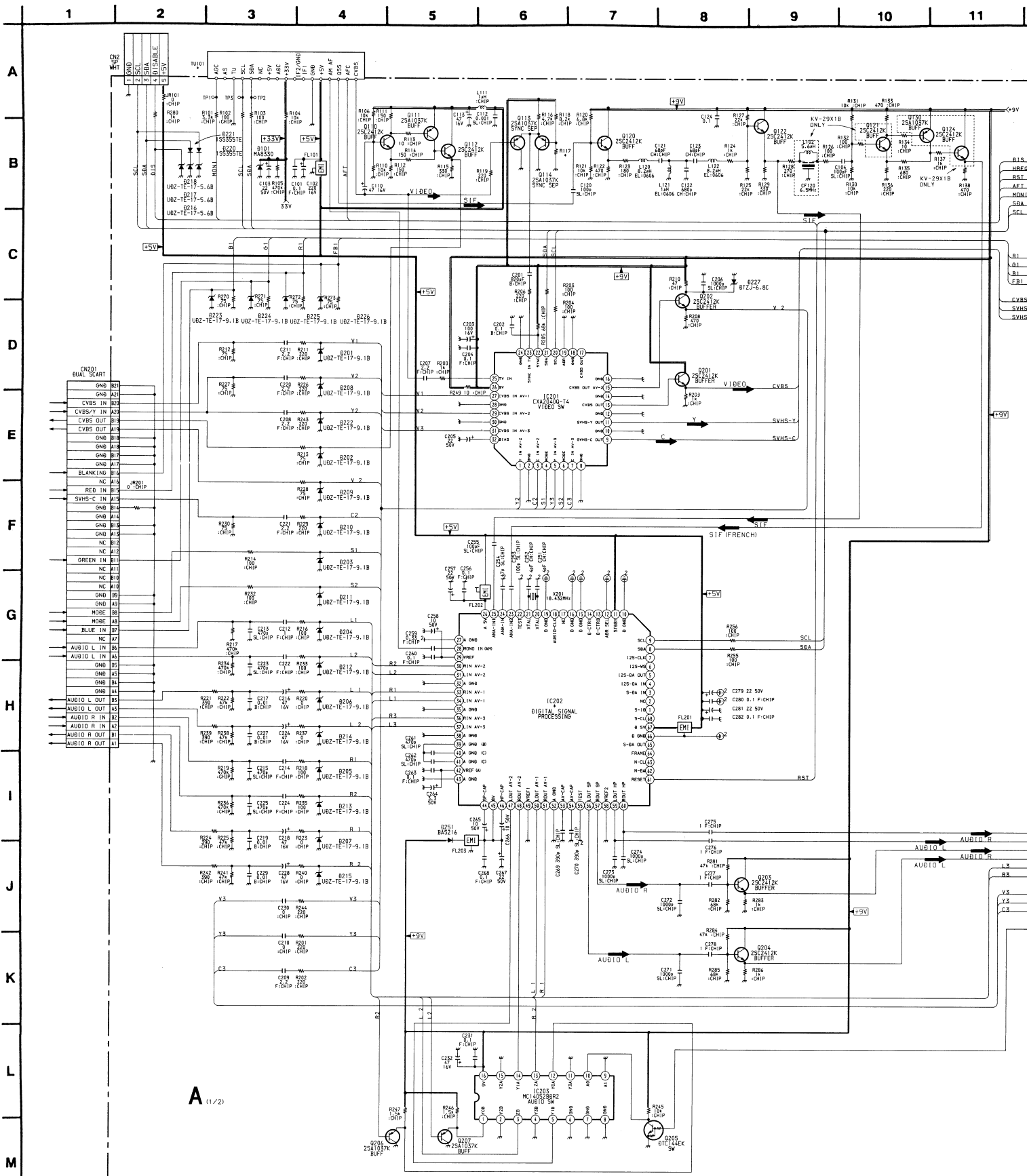


D BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q501	-0.1	0.2	-
Q502	0.1	-5.8	-
Q503	-5.8	-12.0	-12.0
Q602	72.0	7.5	72.7
Q603	0	72.0	-
Q604	0.7	-	-
Q605	0.5	-	0.3
Q606	-	-	12.0
Q607	-	12.0	-
Q800	0.2	3.1	-
Q801	0.3	17.0	-
Q802	-0.2	143.3	-
Q803	-0.6	99.8	-
Q805	-	3.6	-
Q900	-	5.4	-
Q1200	2.9	21.5	4.6
Q1201	3.4	5.0	3.0
Q1202	2.8	-	-

D BOARD IC VOLTAGE TABLE

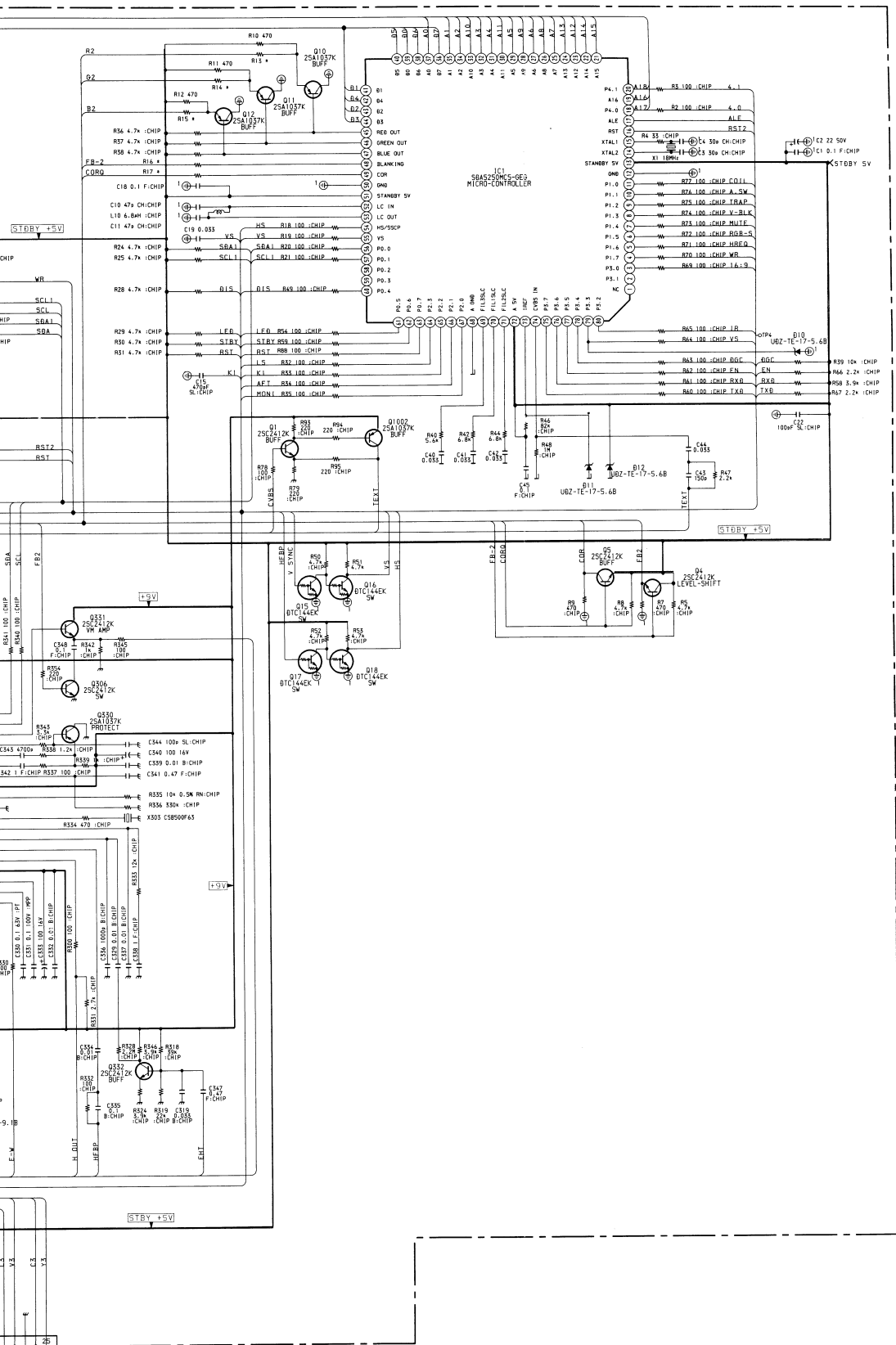
IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC500	1	1.5
	2	15.0
	3	-12.3
	4	-14.0
	5	0.1
	6	15.2
	7	1.4
IC600	1	170.0
	2	-62.4
	3	-62.6
	4	-62.2
	5	-62.0
	6	-62.6
	7	-62.4
	8	-62.0
	9	-58.0
IC601	1	64.3
	2	63.0
	3	-62.5
	4	-58.6
IC602	1	135.0
	2	63.2
	3	-0.1
IC800	3	0.9
	5	1.5
	6	2.0
	7	0.2
	8	9.0
IC1200	2	21.7
	4	21.5
	5	-21.7
IC1201	1	4.0
	2	9.0
	3	4.0
	5	0.5
	8	0.5



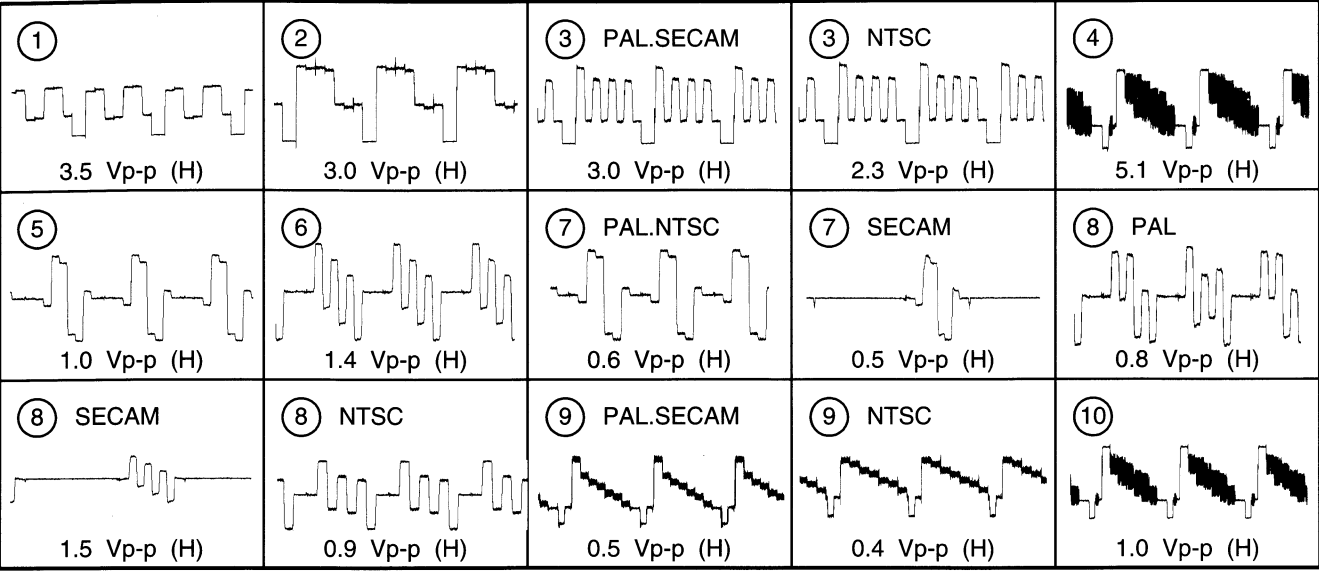
A BOARD * MARK

Model	29X1A	29X1B	29X1D	29X1E	29X1K	29X1L	29X1R	29X1U
Ref. No.	—	—	—	—	—	—	—	—
C370	—	2.2UF	2.2UF	2.2UF	2.2UF	—	2.2UF	—
C372	—	0.1UF	0.1UF	0.1UF	0.1UF	—	0.1UF	—
C373	—	0.22UF	0.22UF	0.22UF	0.22UF	—	0.22UF	—
D370	—	BAS216	BAS216	BAS216	BAS216	—	BAS216	—
IC3	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101	TMS27PC010A-15FMBE101
IC202	MSP3400C-PS	MSP3410-15	MSP3400C-PS	MSP3410-15	MSP3400C-PS	MSP3410-15	MSP3400C-PS	MSP3410-15
IC303	—	TDA8395T	TDA8395T	TDA8395T	TDA8395T	—	TDA8395T	—
R13	150	—	150	150	150	150	150	150
R14	150	—	150	150	150	150	150	150
R15	150	—	150	150	150	150	150	150
R16	100	—	100	100	100	100	100	100
R17	100	—	100	100	100	100	100	100
R17	1.8K	1.8K	1.8K	1.8K	1.8K	1.8K	1.8K	2.0K
TU101	TUVIF (AEP)	TUVIF (FR)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (UK)





WAVEFORMS A BOARD

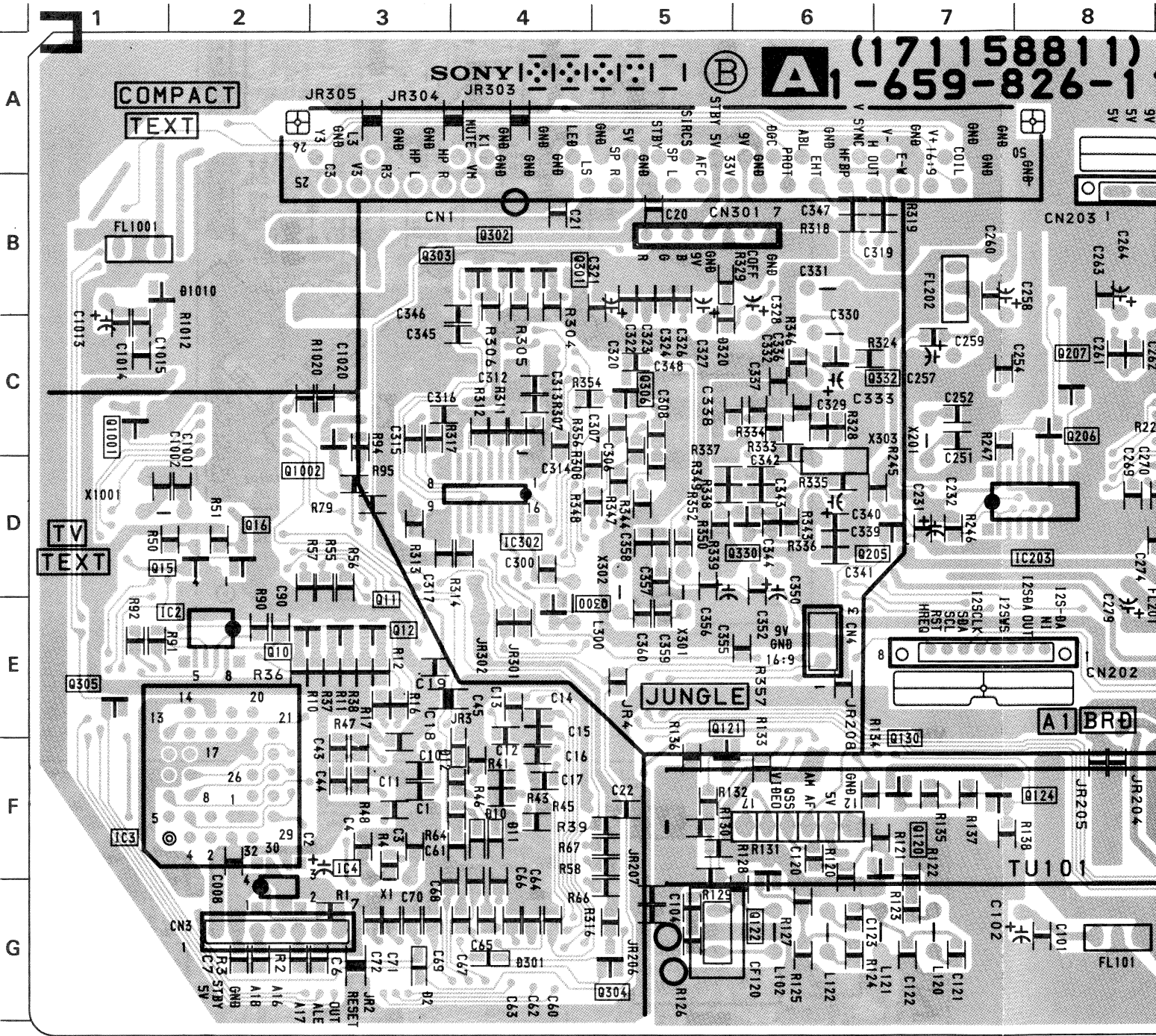


A (2/2) BOARD IC VOLTAGE TABLE

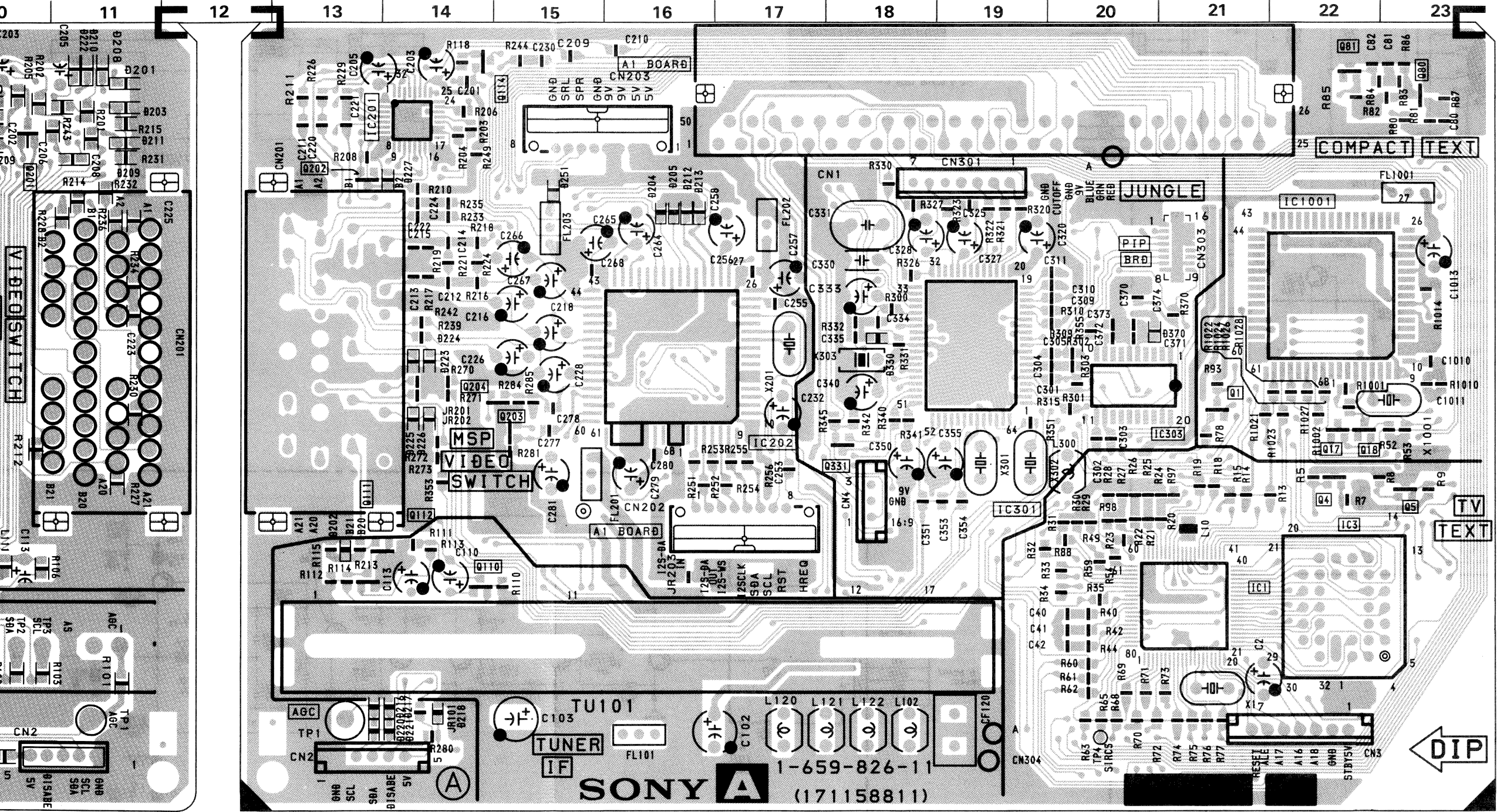
IC Voltage Table								
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC1	2	3.6	IC301	5	3.6	IC301	61	5.0
	3-4	4.8		6	5.0		62	7.6
	5	0.5		7-8	5.4	IC302	1	4.8
	7	4.8		10	0.6		5	0.7
	9	4.8		12-14	5.4		9	4.8
	11	2.4		16	4.0		11-12	3.0
	13	4.8		17-19	5.4		14	1.3
	14-15	2.3		20	8.8	16	1.3	
	16-17	4.8		22-23	2.2	IC303	5	8.0
	48	4.0		24	2.0		3.2	10
	51	4.8		25	2.4		11	5.6
	52-53	2.4		26	2.0		0	19
	54	0.7		27	4.0		20	3.7
	55	0.2		28	6.6		4	0.2
	56-57	4.8		29	8.8		5	0.7
	58	2.8		31-33	3.0	IC1001	4	0.2
	59	3.5		34	4.0		5	0.7
	60	2.4		35	4.6		6	1.7
	62	0.7		36	8.8		7	1.8
	63	4.4		37	3.1		10	0.4
	65	4.8		38	3.4		11-12	4.8
	66	2.1		39	5.3		16	4.8
	67	2.0		40	4.2		17	0
	69-71	2.3		41	2.3		21	4.8
	72	4.8		43	1.7		23	3.0
	73	1.5		44	8.8		25	4.8
	74	1.2		45	2.5		56	0
	75-77	4.8		46	3.9		61	1.3
	79	0.2		47	3.0		62-63	1.4
	80	4.8		48	4.4		64	0
IC2	5-8	4.8	49	6.3	66		4.6	
IC3	1	4.8	50-51	0.1	67		4.7	
	31-32	4.8	53	3.9	68		4.0	
IC4	1	4.8	54	5.0				
	3	4.8	55-56	4.2				
IC301	1	1.5	58-59	8.8				
	3-4	5.6	60	5.3				

A [TUNER, AUDIO CONTROL VIDEO SW, DIGITAL SIGNAL PROCESSING
Y/C JUNGLE MICRO CONTROLLER]

A Board <Conductor Side>

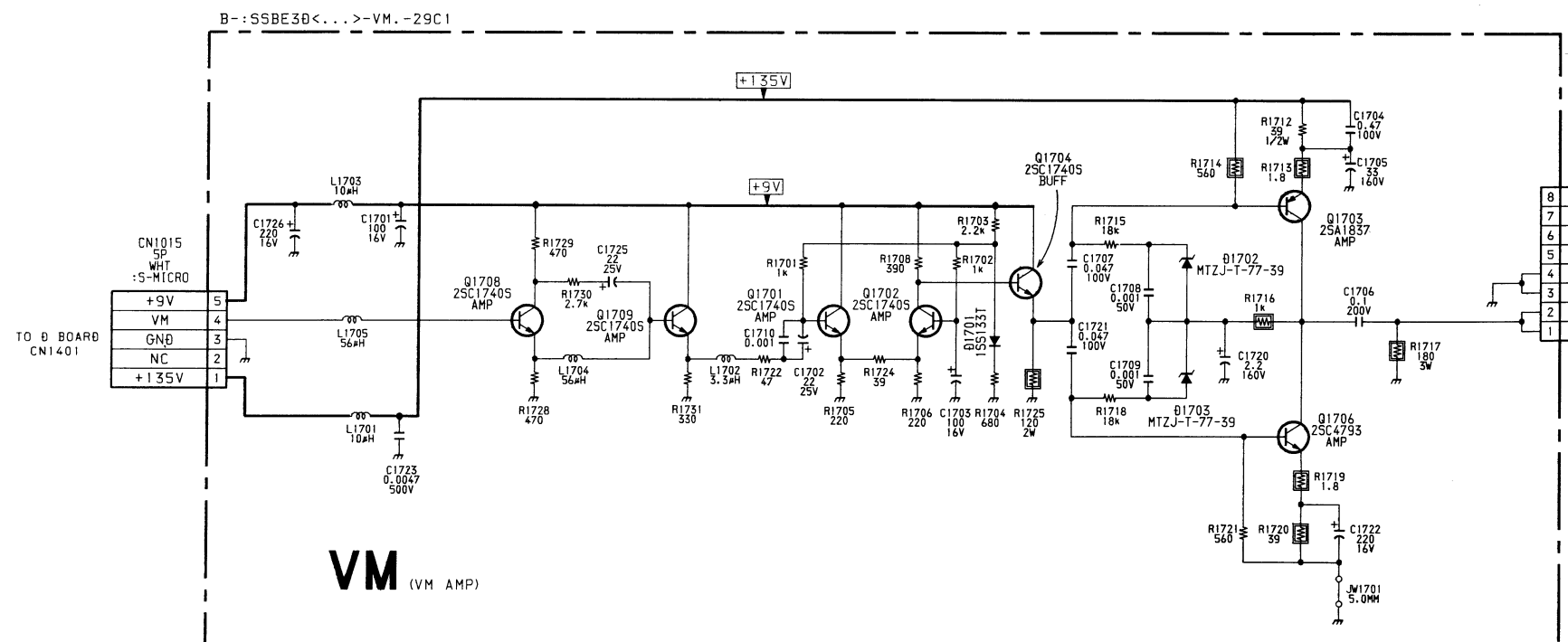
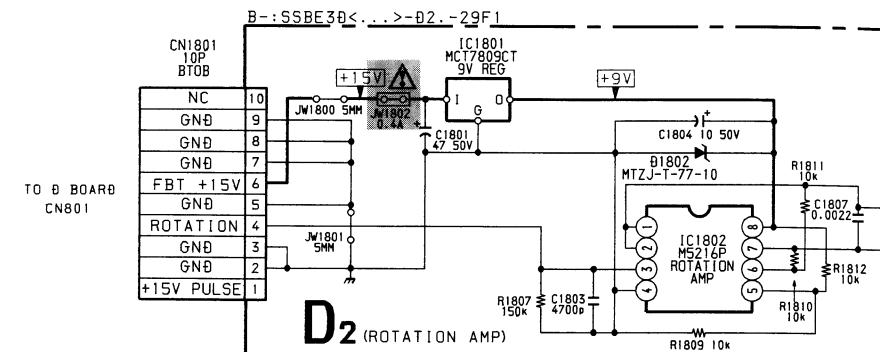
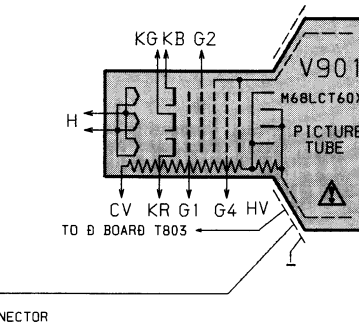
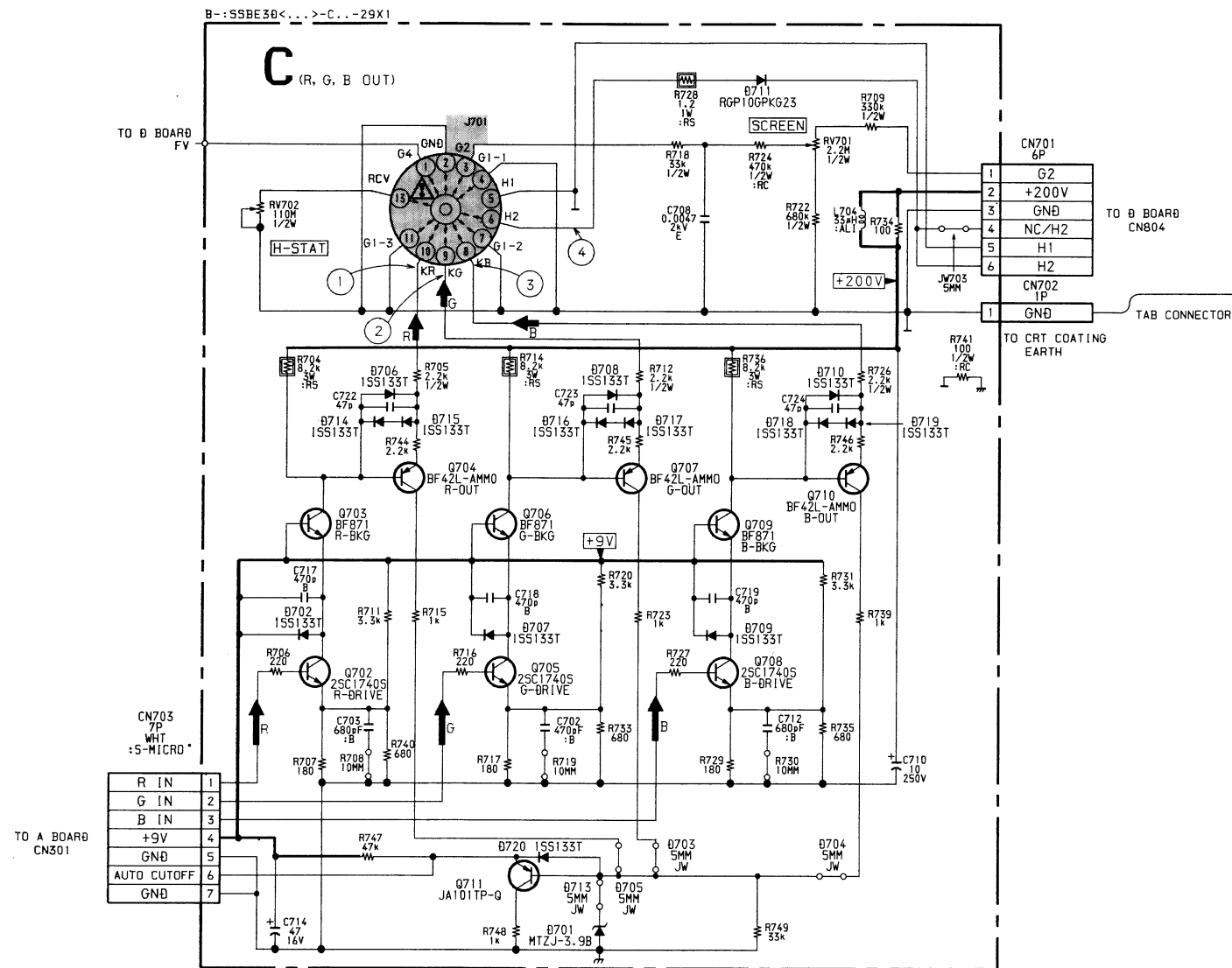


A Board <Component Side>



A BOARD

IC		Q305	
IC1	F-21	Q306	C-5
IC2	E-2	Q330	D-6
IC3	F-2	Q331	D-18
IC4	G-2	Q332	C-6
IC201	A-14	Q1002	C-3
IC202	C-16	DIODE	
IC203	D-8	D2	G-3
IC301	C-19	D10	F-10
IC302	D-4	D11	F-10
IC303	D-21	D12	F-4
TRANSISTOR		D101	F-9
Q1	D-21	D201	A-11
Q4	E-22	D202	E-13
Q5	E-23	D203	A-11
Q10	E-2	D204	B-16
Q11	E-3	D205	B-16
Q15	D-2	D206	C-9
Q16	D-2	D207	C-9
Q17	D-22	D208	A-11
Q18	D-23	D209	B-11
Q80	A-23	D210	A-11
Q81	A-22	D211	B-11
Q110	F-14	D212	B-16
Q111	E-14	D213	B-16
Q112	E-14	D214	D-9
Q113	A-10	D215	D-9
Q114	A-14	D216	G-14
Q120	F-7	D217	G-14
Q121	F-5	D218	G-14
Q122	F-6	D220	G-14
Q124	F-7	D221	D-14
Q130	F-7	D222	D-14
Q201	B-10	D223	D-14
Q202	B-13	D224	D-14
Q203	D-15	D225	D-14
Q204	D-15	D226	D-14
Q205	D-7	D227	B14
Q206	C-8	D251	B-15
Q207	C-8	D320	C-5
Q300	E-4	D370	C-21
Q304	G-5		

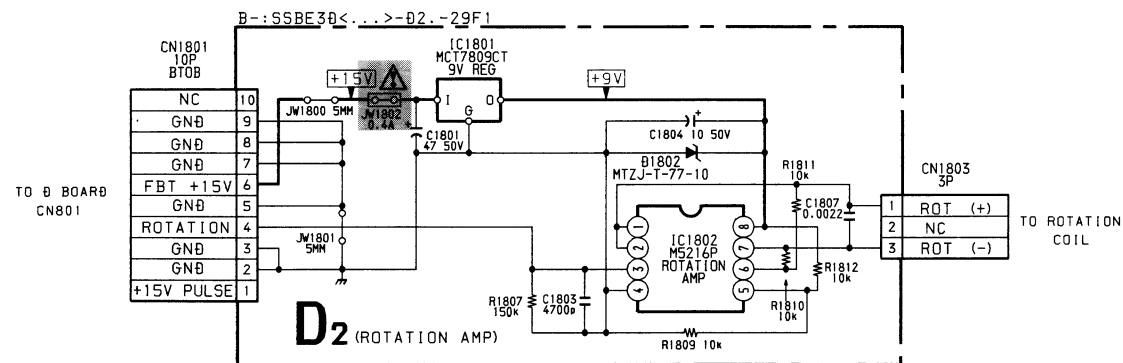
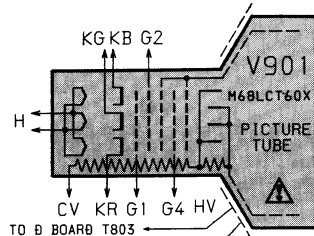


1	CN701	6P
2	G2	
3	+200V	
4	GND	
5	NC/H2	
6	H1	
	CN702	1P
1	GND	

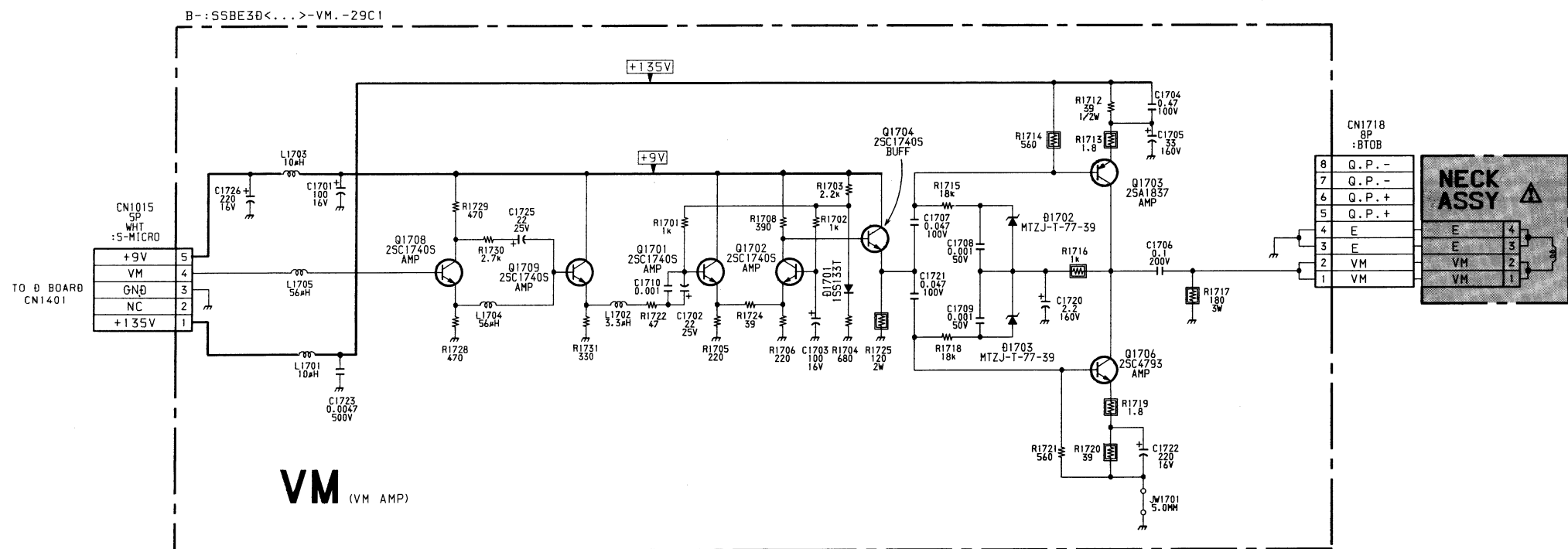
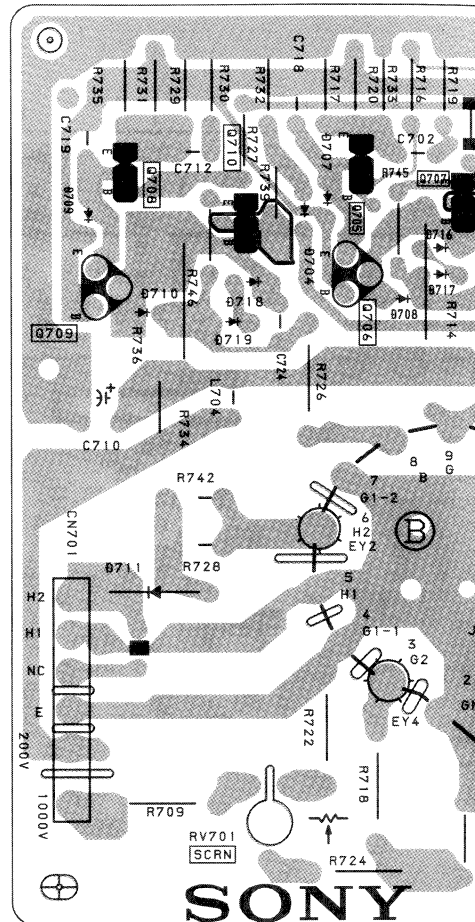
TO B BOARD
CN804

TAB CONNECTOR

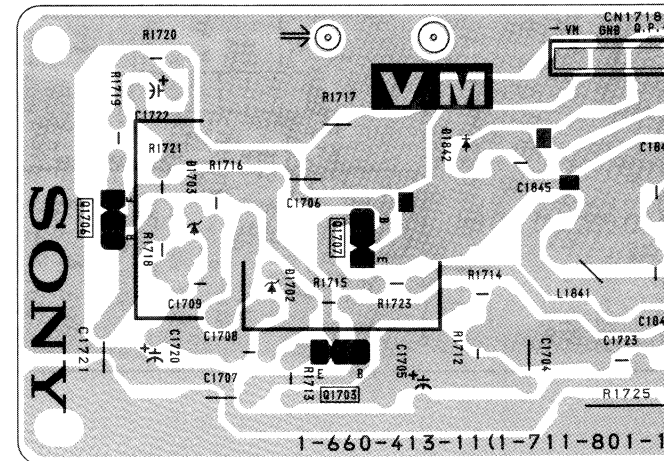
TO CRT COATING
EARTH



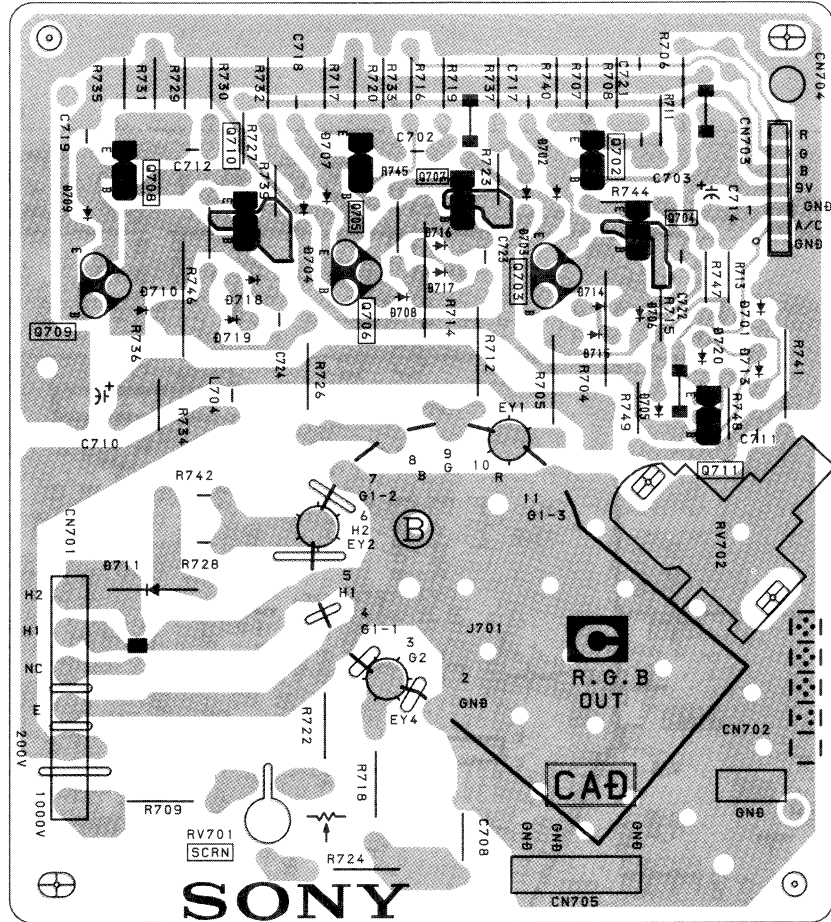
C Board



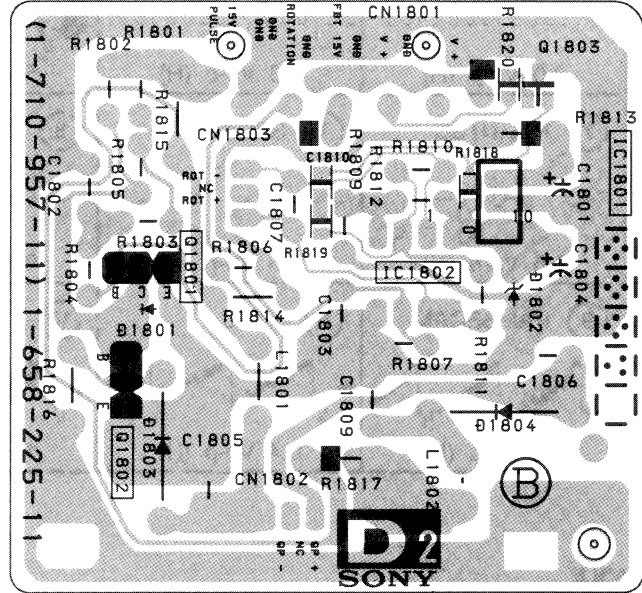
VM Board



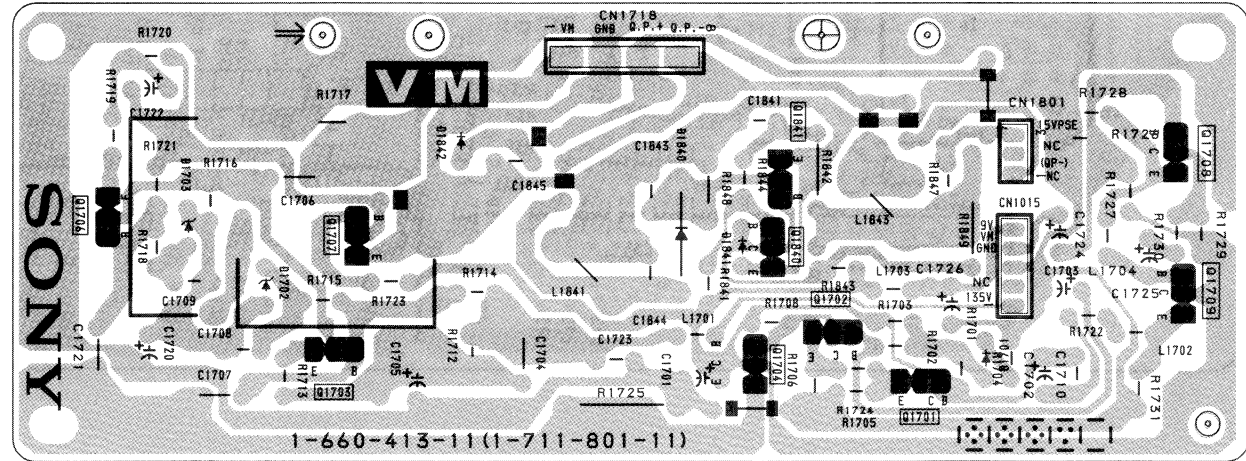
C Board



D2 Board



VM Board



C BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table				
Ref No	B Base	C Collector	E Emitter	
Q702	2.0	11.4	1.4	
Q703	12.0	168.3	11.4	
Q704	168.3	6.0	163.5	
Q705	1.7	11.4	1.2	
Q706	12.0	178.8	11.4	
Q707	178.2	6.2	173.8	
Q708	2.0	11.4	1.4	
Q709	12.0	168.3	11.4	
Q710	168.0	6.4	160.0	

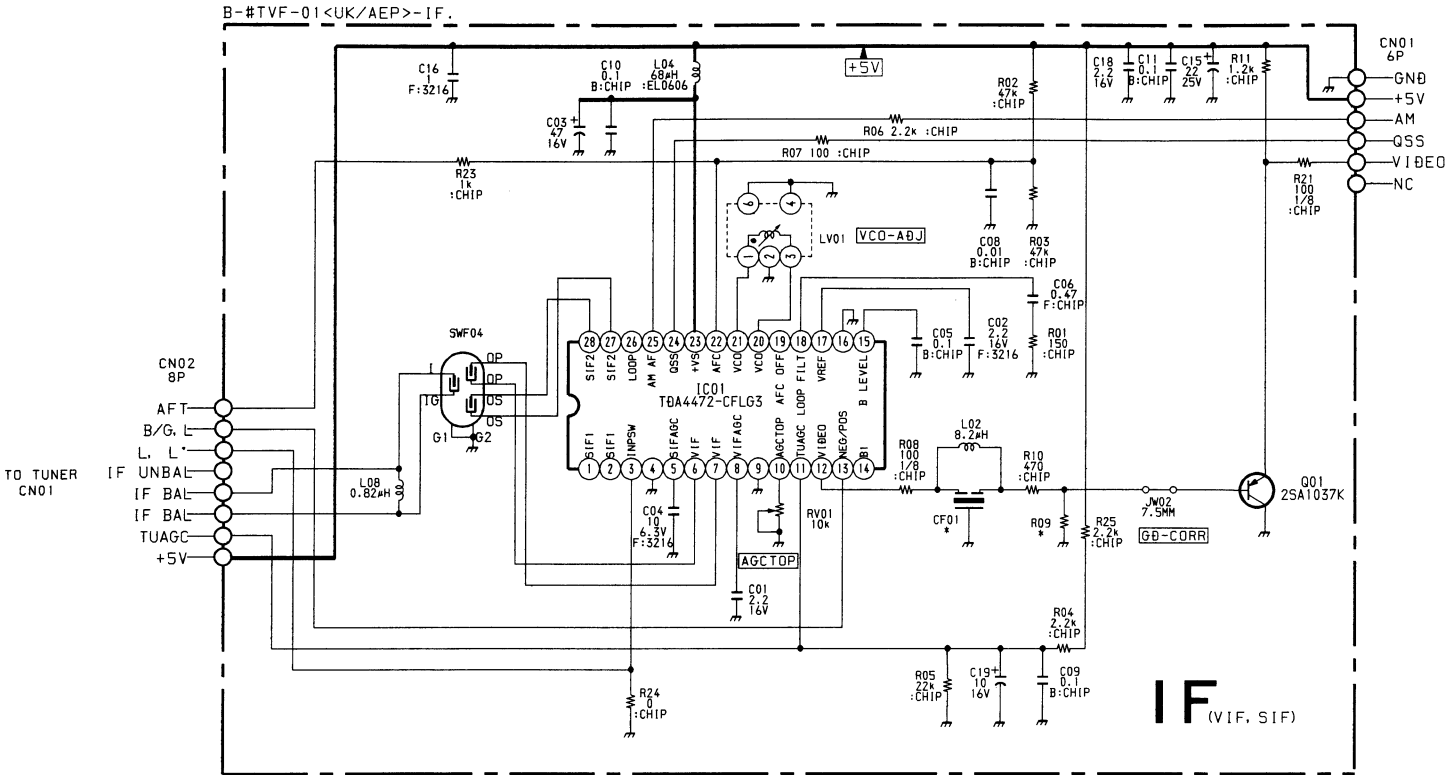
VM BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table				
Ref No	B Base	C Collector	E Emitter	
Q1701	2.5	8.8	1.8	
Q1702	2.5	5.5	1.8	
Q1703	134.3	71.8	134.8	
Q1704	5.5	8.8	4.8	
Q1706	1.0	71.8	0.4	
Q1707	0.7	-	-	
Q1708	2.9	6.6	2.2	
Q1709	2.2	8.8	1.5	
Q1840	0.6	-	-	

D2 BOARD IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC1802	1-2	2.8
	3	3.0
	5-6	4.4
	7	6.2
	8	9.0

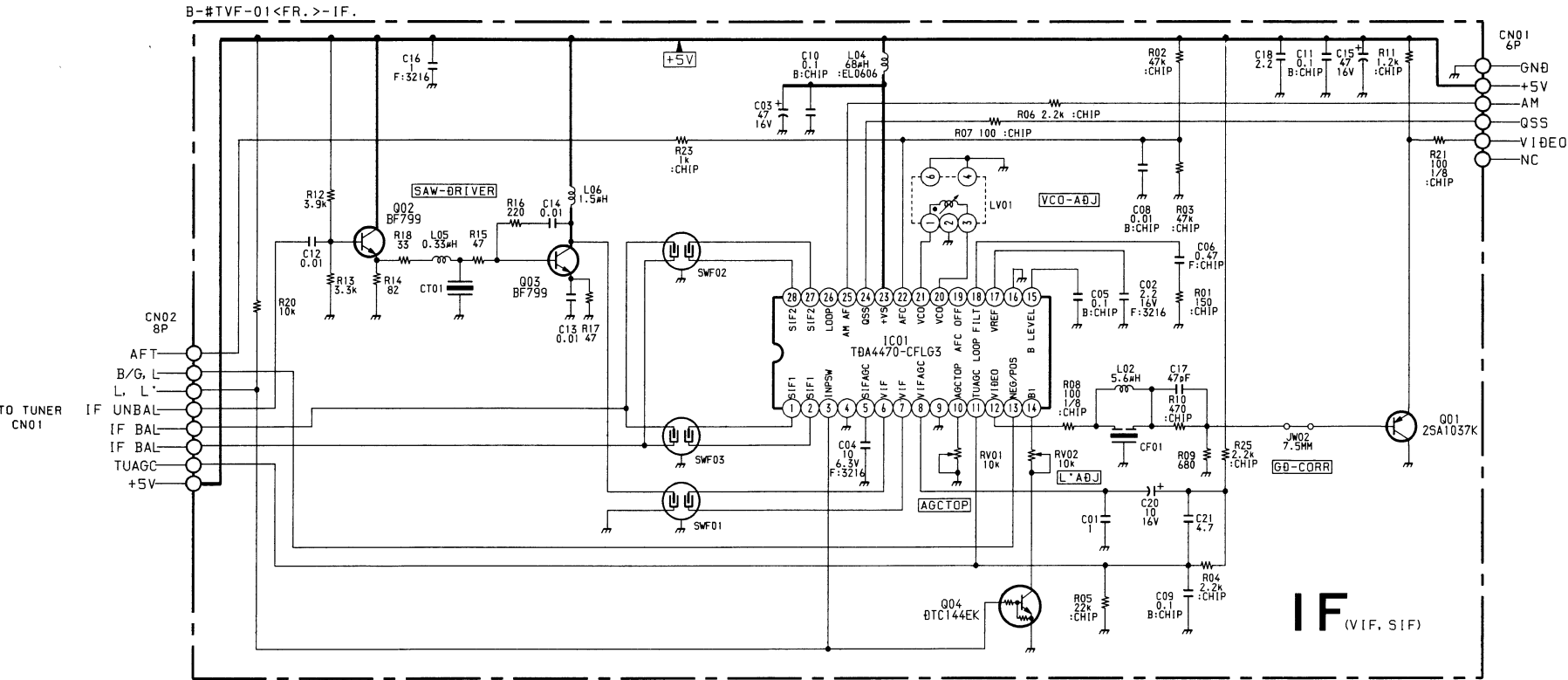
TUVIF (AEP) (KV-29X1A, 29X1D, 29X1E, 29X1K, 29X1L and 29X1R ONLY)
TUVIF (UK) (KV-29X1U ONLY)



IF Board

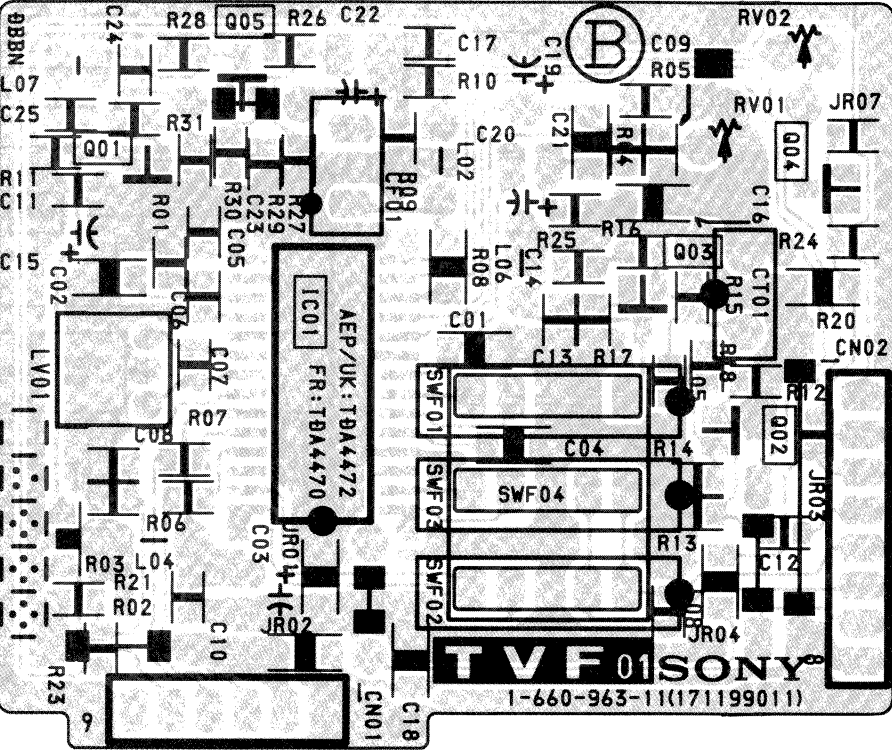
Model Ref. No.	29X1A	29X1D	29X1E	29X1K	29X1L	29X1R	29X1U
CF01	5.5MHz	5.5MHz	5.5MHz	5.5MHz	5.5MHz	5.5MHz	6.0MHz
R09	680MF	680MF	680MF	680MF	680MF	680MF	1K

TUVIF (FR) (KV-29X1B ONLY)

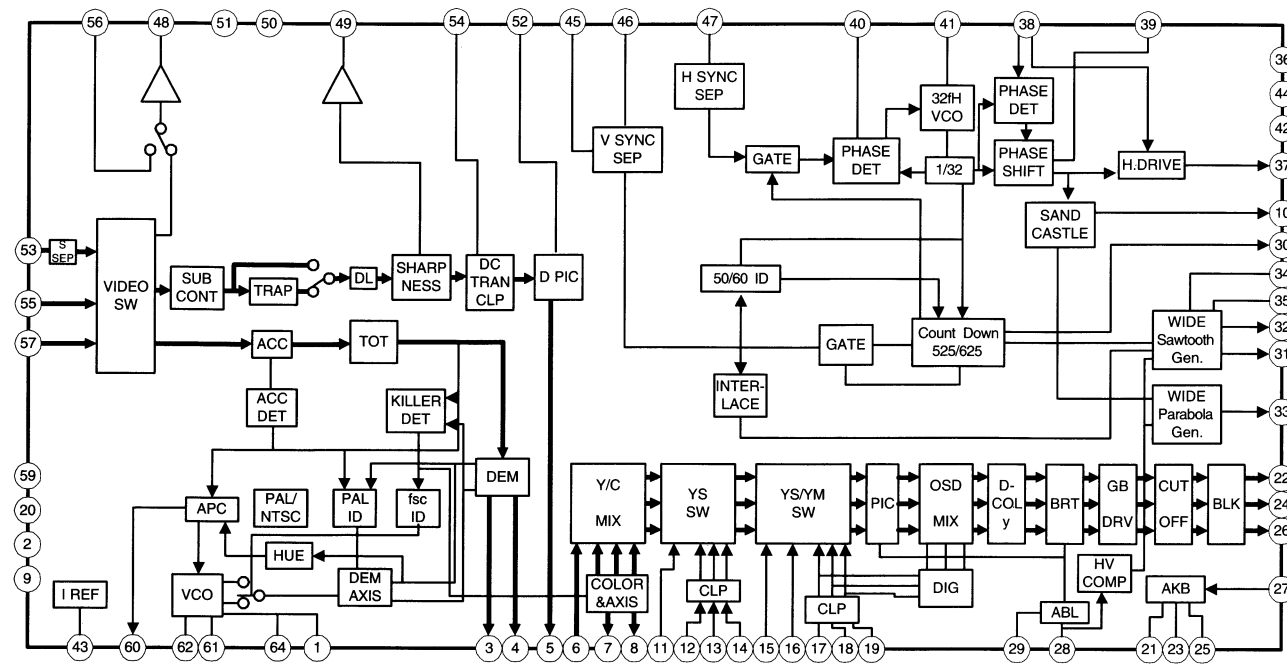


IF [VIF, SIF]

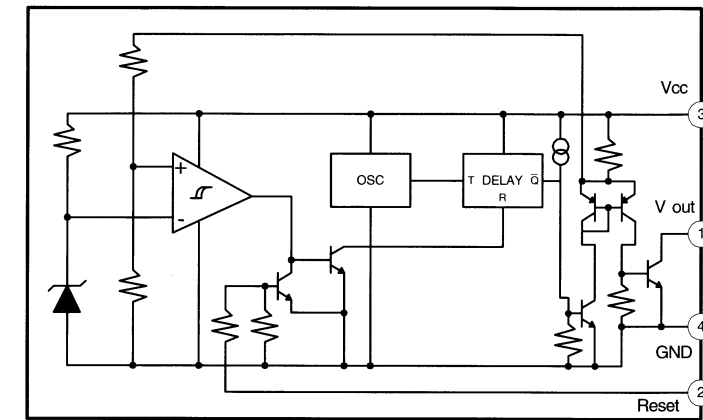
IF Board



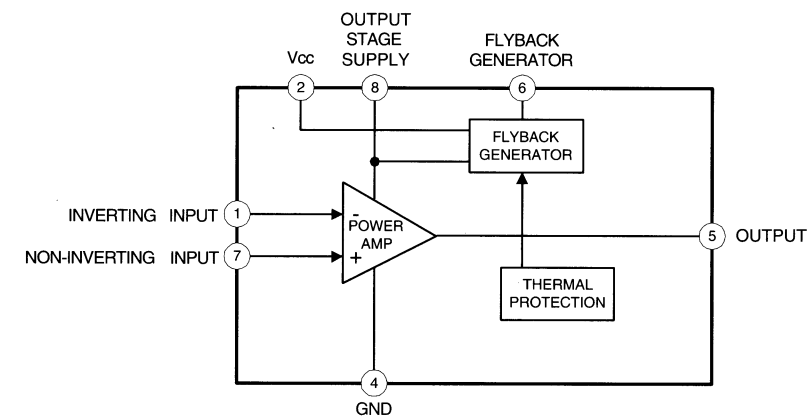
A BOARD IC301 CXA2000Q-TL



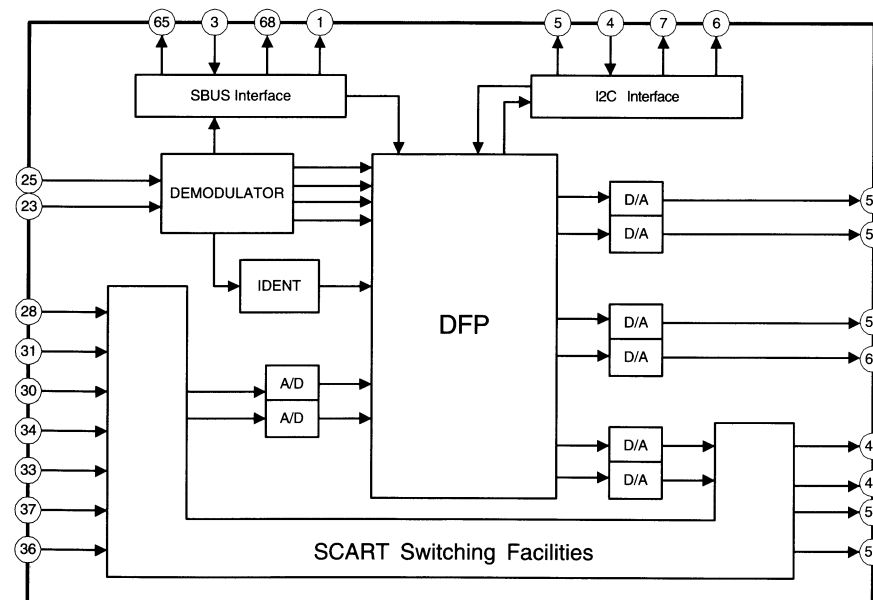
A BOARD IC4 PST593C



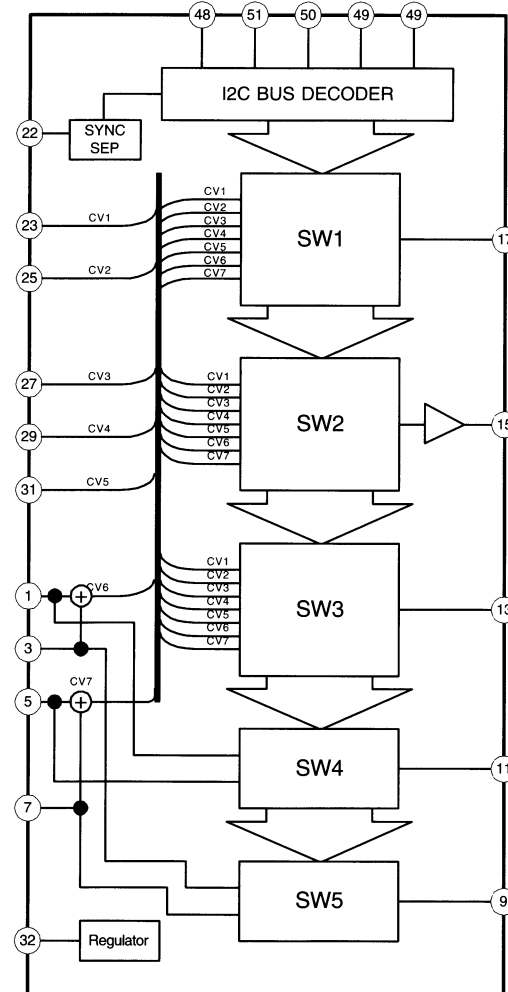
D BOARD IC500 STV9379



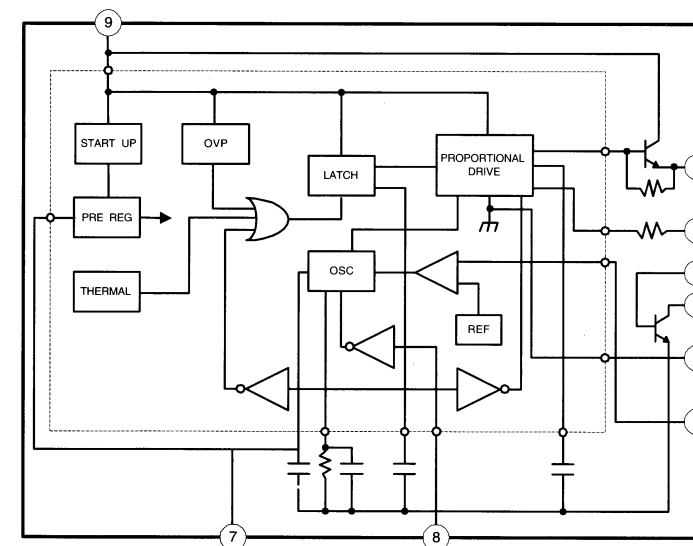
A BOARD IC202 MSP3410/MSP3400



A BOARD IC201 CXA2040Q



D BOARD IC600 STR-S6708



D BOARD IC1200 TDA7264

